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NOVEMBER 4, 1986

- Searching for security
- The MIS drug abyss
- The next step in systems development
- Hello, voice packets
- Micros: Entry engines

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THE MAGAZINE FOR MIS EXECUTIVES
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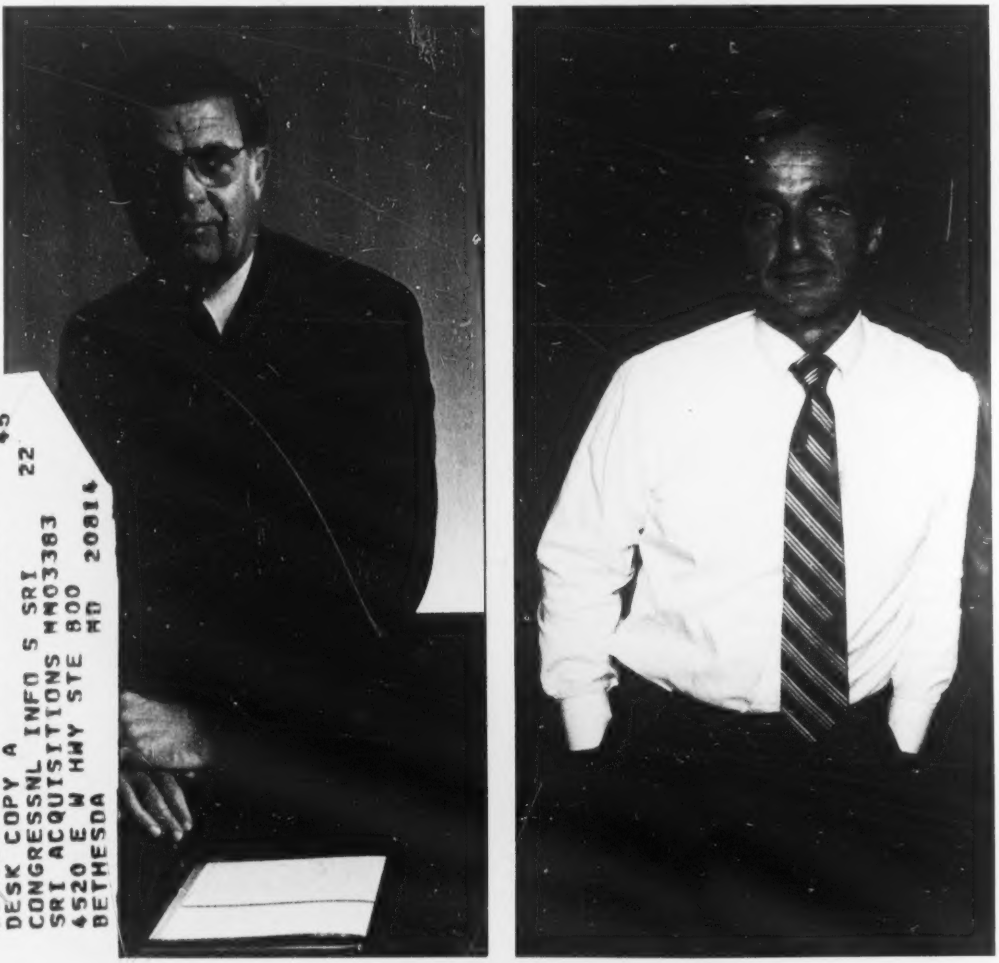
ALTERNATIVES TO SIERRA



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Can MIS find real alternatives to IBM in the plug-compatibles of Amdahl and NAS?

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Amdahl's John C. Lewis (left) and NAS' David N. Martin say they've got the products and strategies to challenge IBM. Users are beginning to decide if they're right.

COMPUTER
DECISIONS

November 4, 1986

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Computer Decisions (USPS 771-040 ISSN 0010-4558) is published biweekly except three issues in September and October for $65 per year by Hayden Publishing Co., Inc., 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address change to *Computer Decisions*, P.O. Box 1031, Southeastern, PA 19398. For subscription information, please call (215) 337-8623.

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Copies printed: 185,063

Wang lap-top hard disk

Wang Laboratories Inc. (Lowell, MA) announced what it calls one of the fastest lap-top computers available. The IBM PC-compatible Wang Laptop costs $3,530 and features an 8-MHz 8086 processor, 512 Kbytes of RAM, a 10-Mbyte hard disk, a high-resolution liquid crystal display, a full-sized keyboard, and a built-in printer.

The new machine puts Wang in the same class as lap-top veterans Grid Systems Corp. (Mountain View, CA) and Toshiba America Inc. (Tustin, CA). Wang is one of only a vew vendors offering built-in hard disks on lap-tops, and is the only vendor offering a 2,400 bit-per-second modem as an option.

Wang also announced that the U.S. Postal Service and the Federal Home Loan Mortgage Corp., among others, have signed purchase agreements for large quantities of the lap-tops. ☐

ITT claims fast PC AT clone

ITT Information Systems, San Jose, CA, recently joined the ranks of vendors offering value-added clones of the IBM Personal Computer AT. The ITT Xtra/286 Advanced Technology Workstation includes a graphics card compatible with IBM's EGA and CGA and Hercules color adapter boards, a 10-MHz processor, and disk-caching software. ITT claims the faster processor and disk-caching software makes the ATW 30 percent faster than a standard 8-MHz PC AT.

The machine is available in two models. The Model I includes 640 Kbytes of RAM and a 1.2-Mbyte floppy drive, and costs $2,499. The Model II ($4,299) features a 30-Mbyte hard disk. For more information, call (408) 942-4000. ☐

Diskless workstations

With its new 3390 micro, NCR Corp. joined the growing number of vendors offering diskless workstations that provide local processing power at only slightly higher prices than many dumb terminals.

The Dayton, OH, vendor has already won over one major user with its diskless micro. New York-based financial services giant E.F. Hutton & Co. Inc. announced it plans to spend $20 million to replace 10,000 existing dumb terminals with NCR 3390s in 400 worldwide branches.

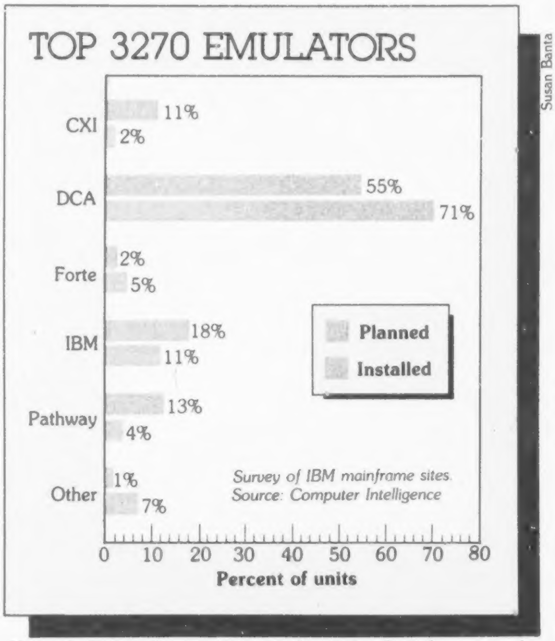
The diskless 3390 includes an Intel 80286 microprocessor running at 6 MHz or 10 MHz, 512 Kbytes of RAM, and serial and parallel ports, and costs from $1,694 to $1,894. With an optional 3½-inch 720-Kbyte floppy drive or 20-Mbyte hard disk, the price goes up to $2,789. All models include either IBM's CGA or EGA, or NCR's NGA video graphics adapters. ☐

IBM, Intel deal blow to clones

Clone makers may have a tougher time copying IBM Personal Computers because of a new agreement between IBM and chip maker Intel Corp. to develop customized chips jointly.

Under the agreement, Intel (Santa Clara, CA), of which IBM owns 13 percent, is receiving technology developed by IBM, including gate arrays, macrocell libraries, design software, and package technology. Intel will combine this technology with its popular chip offerings to produce customized hybrids, called application specific integration curcuits, for IBM.

Currently, IBM PCs and their imitators are based on the same Intel 8088 and 80286 microprocessors. Analysts speculate that the next generation of IBM micros will use proprietary chips. These chips will incorporate capabilites of current Intel chips to run MS-DOS applications but will have additional power and functionality. ☐



Susan Banta

Although Digital Communications Associates Inc. dominates the terminal-emulation board market, other vendors may be gaining ground, according to Computer Intelligence Corp. The market researcher reports that in a survey of IBM mainframe users, 55 percent said they plan to buy boards from DCA; the vendor currently controls 71 percent of the market.

DCA buys connections

The recent acquisition of communications software vendor Microstuf Inc. by Digital Communications Associates Inc. means that DCA will be able to offer one-stop shopping to users looking to connect IBM Personal Computers to hosts.

"Whether it be asynchronous-to-asynchronous communications, or asynchronous-to-synchronous, DCA should now be able to offer users what they need," says Ilene Goldman, an analyst with International Data Corp., Framingham, MA. Microstuf (Roswell, GA), markets asynchronous communications software. DCA (Alpharetta, GA) sells network communications systems. ☐

standard IBM 3770 or 2770 communications lines." IBM did announce APPC/VM for seamless transfer of data between VM machines, but it uses a limited subset of LU 6.2. IBM openly hints at future peer-to-peer support for VM systems.

Offices already running Profs should greet the 937Xs with open arms. The Canadian branch of New York Life Insurance Co. (New York), for example, has a nationwide network of Profs users tied to two IBM 3083s in Vancouver. Project leader Chris Alley sees a potential role for a 937X as a Profs hub in the western part of Canada, where communication with a local procesor would reduce response time. But Alley wonders whether the smaller 370 machines could accommodate Profs' database manager. "If you have a large number of Profs users, you might need more storage and processing power than a smaller computer could provide," he says.

Several experts question whether the 937Xs offer have enough processing clout. Some wonder whether the 937X line, with its relatively old 370 architecture, can provide the power needed for highly interactive office applications. "The 370 architecture uses layer upon layer of software to provide interactivity and database capabilities," asserts David H. Andrews, president of Andrews, Duerr and Manteghian, a Cheshire, CT-based consultancy. "Much of the 937X's processing power will be chewed up running systems software. These software layers also require a lot of time and expertise to install and maintain."

IBM's Friedman counters that customers want full-fledged versions of 370 software on office machines, and says the 937Xs are powerful enough to handle them. He says a 9373 Model 20 running the Profs Text/Office module, Netview, and VM/IS including VTAM will run efficiently with the minimum 4 Mbytes of RAM.

Experts say the VM-based 937X line will be most popular for corporations that need remote processors for application development and office automation. At Bell South Services (Atlanta), MIS has discussed the possibility of installing 937Xs in some departments for those purposes. Bell South has VM mainframes in Atlanta and Birmingham for its programmers. The programmers use Profs for electronic mail and as a database facility for Displaywrite 370 documents, according to MIS director Michael Freeman. All nonprogrammers at Bell South currently use DEC VAXs; these other users, which include small groups of engineers, cannot access Profs or VM's development capabilities. With the 937X line, Bell South can now justify installing 370 machines for a relatively small number of users for engineering applications. For traditional office functions, however, Bell South is committed to All-in-One.

Although the 937X series is still too new for most users to have made firm plans for it, analysts agree that it will be a significant OA alternative for large corporations. "IBM has said that the 9370 series is for people who have an affinity for the 370 architecture," says Marty Gruhn, vice president of the Sierra Group, a market researcher in Tempe, AZ. "If you have any sense, this is what you'll buy if you're a large IBM user. The System/3X line is for non-IBM companies that don't have an established base of 370 software and expertise. As for DEC, when users' demand for software elegance overrides MIS demands for easy solutions, then it will still be a presence." *—Jennifer E. Beaver*

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kets. MIS users concerned about the technical problems, and inelegance of connecting VAXs for commercial distributed processing are probably waiting for an IBM solution anyway, he notes.

Djurdjevic points out that the graduated one-time software prices for VM and VSE programs also bring IBM's pricing for distributed minicomputers in the same ballpark as DEC's. However, the graduated pricing scheme does not benefit users of IBM's largest machines. For example, the previous cost of licensing VM/SP HPO for three years was $62,900. The new one-time cost for VM/HPO can go as high as $101,700.

—Joseph Braue

DATA COMMUNICATIONS

PACKET USERS MAKE THE TELENET SWITCH

As a part of the merger that formed US Sprint Communications Inc., customers of the packet-switched services of Uninet Inc. are migrating to the more robust GTE Telenet Communications Corp. The transition, which was scheduled to have been completed this month, according to Floyd Trogdon, Telenet's vice president of network services, has created only minor problems for users.

However, Uninet users making the switch will be getting a new pricing schedule for their troubles. During the transition, about 30 Telenet and Uninet customers have been picked off by rival network Tymnet from McDonnell Douglas Network Systems Co., San Jose, CA. According to a corporate spokesperson, Tymnet is in part promoting the similarity between Tymnet and Uninet billing structures to woo potential customers.

Telenet Communications Corp.

Floyd Trogdon, vice president of network services at Telenet, says the merger between Uninet and Telenet has resulted in a more powerful network.

Bill to suit. Before the merger, Uninet based its billing on kilocharacters, units of 1,000 characters; Telenet based its billing on kilopackets, 1,000 128-character packets. In July, Telenet started basing its billing on kilosegments, 1,000 64-character packets.

Some Uninet customers balked at making the transition to kilosegments immediately. "Many of the Uninet customers wanted to stay with the kilocharacter scheme because they were already comfortable with that method of charging," says Trogdon. "We've allowed them to stay with the old billing until July 1987. In some cases, at the customer's request, we've permitted them to do so for over two years."

Nevertheless, those years fly by quickly. Tymnet knows this, and, according to a spokesperson, is putting the call out to customers who want to stay with kilocharacter billing. "We get lists of Uninet customers, and take into account the fact that they will be disrupted by the switch," the spokesperson says. Mitch Stocks, vice president of telecommunications at Aviotex, Costa Mesa, CA, a nationwide provider of aviation weather and flight planning information, decided to switch from Uninet to Tymnet. "The nail that sealed the coffin was the pricing change," he says. "Telenet went from the Uninet kilocharacter pricing, which was attractive, to kilosegment pricing, which was unattractive."

Customers like Stocks use packet switching for interactive applications sending a small number of characters at a time. Under Telenet's new billing scheme, they would be charged for a kilosegment for every transmission, even if a full kilosegment isn't used. With Tymnet's kilocharacter pricing, Stocks' charges are much less than they would be on a kilosegment basis, he says.

However, according to John Vernagus, Telenet's director of marketing programs, users must be aware that prices for any network will vary according to a particular application. For example, in a credit card authorization scheme, a user would not typically fill up a kilosegment, because he or she is simply sending bursts of data from a remote character reader with a credit card and receiving an authorization code back. For such applications, Vernagus says, Telenet offers a special option called transaction pricing. "Kilosegment pricing is for more data-intensive applications," Vernagus says. "It allows users to take advantage of terminal intelligence and fill up the network envelope. Users get the best of both worlds."

Tymnet counters that under kilocharacter pricing, a customer is only charged for the characters being sent over the network and is not charged for such extras as carriage returns and addressing the computer. "As soon as you hit the Tymnet interface, all overhead is stripped away and at that point the accounting takes place," says a Tymnet spokesperson. "In a segment, you are charged for a 64-character packet. A kilosegment is a nebulous figure because a user can't tell what quantity of that segment is being filled and what amount is network overhead."

Loyal followers. Many Uninet customers decided to move to Telenet despite the billing changes. Ron Reitz, VAX technical support specialist at Johnson Controls, a diversified manufacturer in Milwaukee, extended his Uninet-type billing for three years. According to Reitz, after three years, Johnson Controls will be in a position to switch suppliers, switch to Telenet's new pricing structure, or renegotiate its contract. Dawn Scott, operations manager at the Milwaukee-based Admiral division of the Maytag Co., the Newton, IA-based appliance manufacturer, says the manufacturer will remain under the Uninet billing for a full year.

Mitch Stocks was also offered a long-term contract. "Our district salesman from Uninet said that we could lock in Uninet pricing by signing in an extended term agreement for three years," he says. "When the offer was finally made, it was really only an extension for about 18 months. Futhermore, we would have had to commit to a minimum of 75 percent of our average monthly billing."

Many of those customers who remained within the fold and made the transition are satisfied. Dawn Scott has approximately 60 employees throughout the United States using Telenet for order entry and inquiry. "We've had a few problems," she says. "We had to change the address on our computer. The other problem was in the software. When we were first bringing up Uninet, we had to use an approach to the protocol X.25 that Telenet was supposed to know about. It didn't. When we came up on Telenet, the network didn't work. We figured out why in 10 minutes. We went back to Uninet until Telenet upgraded its software. By the next day we switched to Telenet again."

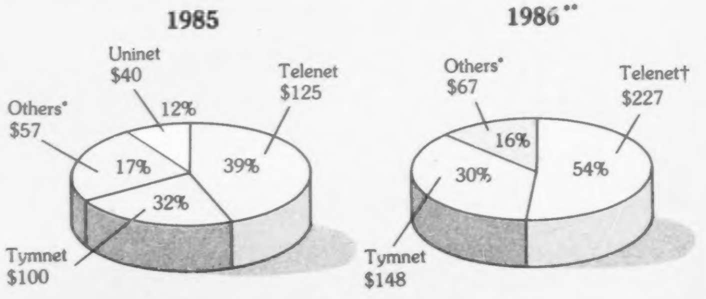
The National Center for Atmospheric Research, a Boulder, CO-based research and development laboratory, also made the transition to Telenet. However, Joseph Choy, group head of networking and data communications, was approached by Tymnet and is evaluating its service. With about 800 users, Choy says his staff did considerable preparatory work with Telenet to make sure the parameters set for the Uninet network were adjusted for Telenet. Despite the advance work, Choy had problems with packet assembler-disassemblers. "Telenet and Uninet PADs don't overlap completely," he says. "Uninet has a PAD in Ames, IA; Telenet does not. Telenet was supposed to install a PAD for us. Because of a mix up, it still hasn't." Nevertheless, Choy is pleased with the transition. The users that came through the Ames PAD temporarily use toll-free numbers. "Telenet charges us for a regular low-density connect," he says. "They wouldn't charge us for the 800 numbers."

Such problems are typical, according to Trogdon. "Every arrangement with a customer has nuances that we haven't anticipated," he says. "We've been able to resolve every one of them. We keep the customer running parallel with Uninet until we are absolutely certain that all the bugs are out."

No answer. However, Stocks cites a lack of support from both Uninet network control personnel and his customer service location in Kansas as the impetus for the switch from Uninet to Tymnet. He says his dissatisfaction began before the merger. "I've called our local support service and there were times that I couldn't find our systems engineer or anyone in our local office. This worsened as the merger came closer because Uninet wasn't interested in expanding the staff."

From a technical perspective, Uninet's remote-call forwarding gave him problems as well, he says. "We had some customers in Colorado that were dialing into an access node in, say, Denver," says Stocks. "Suddenly there was a problem with it. They called us and we began to trouble-

TELENET EXTENDS VAN LEAD



*Others include IBM Information Network, GEISCO, Boeing Computer Services, ADP, and AT&T.
**Projected market shares for 1986.
†After merger of US Sprint and GTE Telenet. Revenues in millions of dollars
Source: Newton-Evans Research Co.

shoot the problem. We discovered that not only was that particular access node out of order, but so were all the other nodes in the state." By talking to staff at the network control center, he discovered that the calls in Colorado, no matter where they originated, were being remote-call forwarded into the PAD center. "If access into the PAD location disappeared for whatever reason—in this case it was a phone line problem—the whole state of Colorado was out of the order," says Stocks. He believes these "single points of failures" occur because Uninet put together its network too quickly. "It was easy to establish a national presence by virtue of the call forwarding trick," he says.

Although Stocks' difficulties were enough to send him to Tymnet, Admiral's Scott, is pleased with Telenet. Telenet and Uninet require different access procedures, but there was no training required, she says. "We reprogrammed our crts for another dialing number and another sequence to get into the network. Our users only punch one key." Choy passed out crib sheets to his users, who are generally adept with computers, to help them with the online documentation procedures.

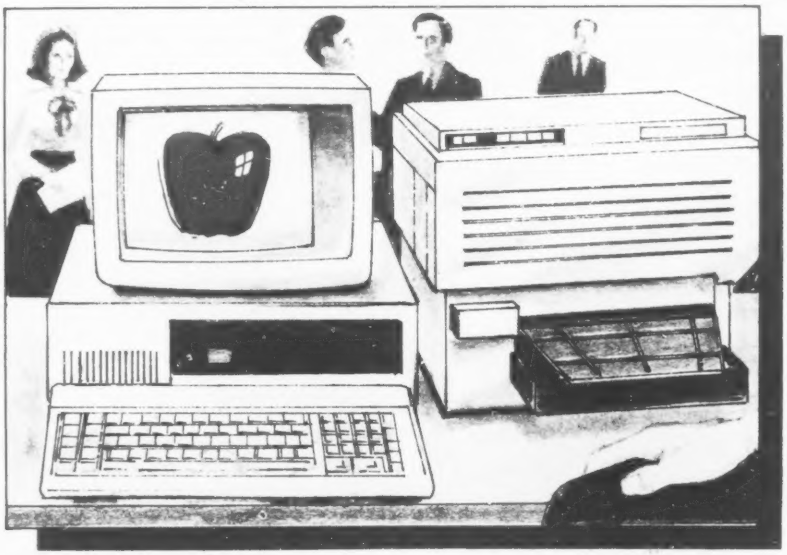
A Tymnet spokesperson says the corporation reaches 109 more cities than does the combined Uninet and Telenet network, a factor that influenced Stocks. "Our decision was based on access locations because we are making plans to go international," he says. In addition, a Tymnet spokeperson says, the Tymnet network is in place and will not undergo any changes. "The merger between Uninet and Telenet could potentially have a period of adjustment, where users may not see the level of service that they are accustomed to," he says.

Floyd Trogdon counters that customers are getting better network coverage, and a more powerful network. "The new integrated network has more advanced technology than Uninet had previously," he says. "It's based on the Telenet technology, but has progressed a little further. Telenet now offers a broad range of protocols and protocol conversion that were not available on the Uninet network."

—Robert Moran

CORPORATE MICROS

IBM GETS DESK-TOP PRINTING LIFT



As the first round of desk-top publishing software for the IBM Personal Computer makes its debut, corporate users are wondering whether the PC can deliver the same functionality as the Apple Macintosh, the graphics-oriented darling of the desk-top publishing world.

For graphics-oriented tasks, such as brochures and newsletters, the Mac from Apple Computer Inc., Cupertino, CA, still reigns supreme. But for those applications in which text is the prime element the IBM PC offers capabilities that may equal or surpass those provided by the Mac.

Some analysts believe that the distinctions between the two micros may be short-lived, however. "The IBM PC will become increasingly like the Mac," predicts Jerry Kocimski, an analyst with Dataquest Inc., San Jose, CA, market researchers. Jonathan Seybold, a publishing consultant in Malibu, CA, believes that IBM will either develop or purchase equipment to make the PC more like the Mac. "IBM has said that desk-top publishing is the application that is driving where microcomputing is going," says Seybold. "IBM is incorporating increased use of graphics, more facile input devices, and increased memory," he says. IBM recently set up a publishing system business unit in Boulder, CO, to put together IBM solutions for clients' publishing needs across the spectrum.

Getting in gear. Much of the new desk-top publishing software for the IBM PC requires the PC to be outfitted with additional hardware that increases its graphics capabilities, including graphics cards and extra memory for graphics processing. A high-resolution monitor is another possible addition, although it is not usually required. Without these additions, according to publishing consultant Bill Dorman of Marshfield, MA, an IBM PC cannot be used as a Wysiwyg (What-you-see-is-what-you-get) device, which means that the user cannot view the page or document until it is printed. Both the Ventura Publishing Edition from Xerox Corp., Stamford, CT, and the IBM PC version of Pagemaker from Aldus Corp., Seattle, have these hardware requirements.

Even with these additions, however, the PC will not work like a Mac. The Mac processes everything, including text, as if it were graphics and has a closed architecture that lends consistency to internal processing. "By putting in these new components, designed by different manufacturers, you are adding additional levels of translation to the PC," explained Dataquest's Kocimski. "The process will be slow, and, if the components don't work well together, frustrating. With the IBM PC, you can spend a lot of money and still be dissatisfied. If you want sophisticated input, it's quite possible you will find that the hardware will not perform to the level of the software, and the software will not perform to the level of the application—so you can struggle, wait, or switch to the Mac."

Aldus is addressing the problem of incompatible hardware upgrades by working with other manufacturers to develop a suite of recommended devices, such as

(Continued on page 30)

FOLLOWING THE LEADERS

MAINFRAMES: A BUYER'S MARKET

With IBM price cuts and alternative mainframes from Amdahl and NAS, MIS executives may now have an advantage in large-system purchases.

by Lee Keough, Industry Editor

MIS managers seeking alternatives to IBM large systems enjoy an advantage they haven't had in years. Early reports from mainframe customers of Amdahl Corp. and National Advanced Systems Inc., the two vendors offering plug-compatible alternatives to IBM mainframes, are generally positive. And with IBM facing a financial squeeze, it has been unusually swift in dropping prices and increasing the performance of its top-of-the-line 3090 series to keep its customers in the fold.

Despite the possibility that IBM may become even more aggressive to protect its turf, most observers believe both Amdahl (Sunnyvale, CA) and NAS (Mountain View, CA) are sitting pretty. They are just starting to ship their versions of IBM's 3090 series and have years to reap the benefits before a new product cycle begins. Additionally, the cycle for disk drives currently coincides with the cycle for mainframes. NAS and Amdahl remarket Japanese versions of IBM's 3380 disk drives and expect to gain big profits reselling this equipment. Add to this the belief of some observers that users, having become more sophisticated, are demonstrating a greater willingness to buy plug-compatible mainframes, and things look very good for the two vendors.

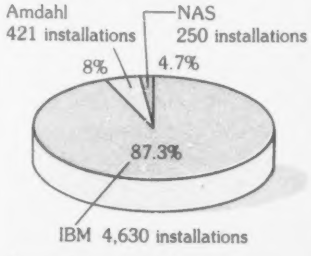
Yet not all reports are glowing. The Hitachi uniprocessor marketed by NAS, the AS/XL 60, has been criticized as performing below the level of the IBM 3090 Model 200 in some applications. NAS claims the AS/XL 60, which began shipping in May, is the functional equivalent of the 3090/200. IBM-watcher Bob Djurdjevic of Phoenix-based Annex Research Inc. rates the AS/XL 60 between 23 million instructions per second and 25 MIPS, slightly below the generally accepted range of 27 MIPS to 29 MIPS for IBM's machine.

NAS officials deny that its processor is performing below expectations. One of its first customers gives the NAS mainframe high marks. Thomas Blodgett, senior vice president of information systems and services at Miami-based Southeast Bank N.A., says early benchmarks for the AS/XL 60 place its performance at 28 MIPS. Blodgett is running all the bank's batch and online production work on the AS/XL 60 under MVS/XA. The online applications, which operate under MVS/XA with CICS, have performed particularly well, he notes. "We see a significant difference in online applications, in terms of response time and cycle time, because of the uniprocessor," says Blodgett. "It's a super online machine." Users pay a performance penalty when running online applications on dual processors, say NAS officials.

Users and vendors have complained for years that a MIPS rating does not necessarily portray processing performance accurately because each mainframe design interacts with various applications in different ways. Some question has also surfaced regarding whether MIPS ratings for Japanese processors are equivalent to MIPS ratings for American-made mainframes.

IBM PCM MARKET

U.S. installations of 308X/3090 class systems



Source: Computer Intelligence

Morgan Stanley & Co., a New York investment house, contracted to buy an AS/XL 60 from NAS shortly after it was announced and had planned to run a number of applications written in A Programming Language (APL) on the machine. After benchmarking the workload on an AS/XL 60, Morgan Stanley was not satisfied with its performance, and canceled the contract. But later this year, Morgan Stanley placed a new order for an AS/XL 60. After benchmarking some of its online applications on other NAS processors, Morgan Stanley found that the AS/XL 60 offered the best performance.

"In some applications we outperform IBM and in some cases we underperform IBM," says Mitch Schoch, director of systems marketing for NAS. NAS officials concede the AS/XL 60 does not perform batch applications as well as the 3090/200, but claim the reverse is true when running interactive applications. If a processor performs significantly below expectations in a benchmark test, Schoch says NAS considers renegotiating the price.

John C. Lewis, Amdahl's chief executive officer, says Japanese mainframes are optimized for scientific computing. When running commercial workloads on a Japanese-manufactured processor, Lewis claims users will not achieve the same performance levels that they would with a scientific workload. Lewis says Amdahl avoids this problem by designing its own mainframe and building it with Fujitsu parts.

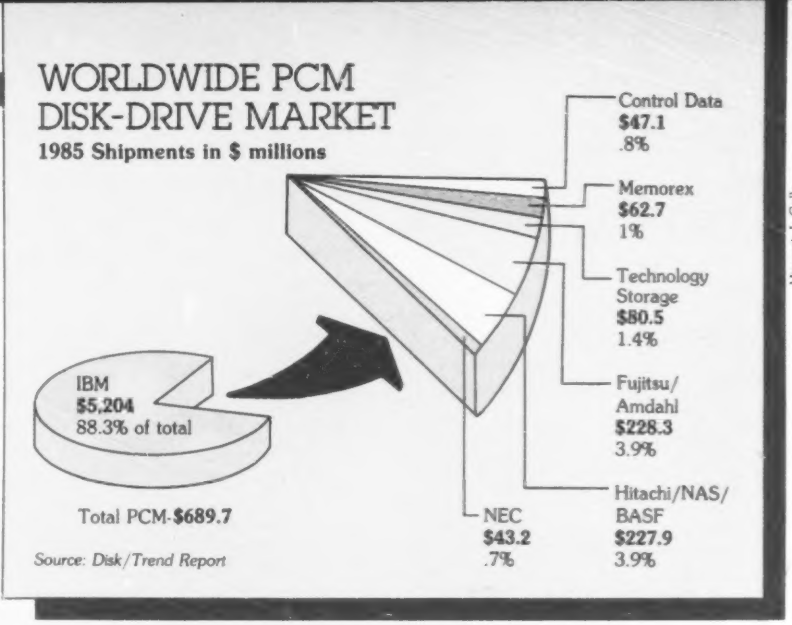
Amdahl's new processor, the 5890/300 is getting an enthusiastic reception. Amdahl says the processor performs about 10 percent above its originally announced levels. "We expected performance levels of about 38 MIPS when we contracted for the machine," says Ronald L. Woodall, executive vice president of information systems for Chilton Corp., Dallas. "But we've exceeded that by 9 or 10 percent." Chilton, a consumer credit reporting service and a subsidiary of Borg-Warner Corp., Chicago, runs its network on the 5890/300 under MVS/XA. Woodall says the mainframe has performed flawlessly since being installed at the end of July, and is providing subsecond response time for online applications.

Online applications are a good choice for the 5890/300, according to David Karney, vice president of MIS for Dallas-based Southland Corp., the $12 billion parent of 7-Eleven and Chief Auto Parts retail stores. Southland, which installed the first 5890 last June, also has an IBM 3090/200 in its shop. Karney says he chose to run batch and test applications on the 3090 and online applications under

CICS on the 5890/300. "The 5890 has a faster processor," he says.

Norman Laefer, a staff analyst at Chicago-based Amoco Corp. and the president of Amdahl's user group, says that although it is too early to judge, users appear to be very pleased with the 5890, especially because it is performing above original expectations.

Djurdjevic says that of the two plug-compatible vendors, Amdahl has the perceived advantage in processors, particularly since it provides features that differentiate its mainframes from IBM's. The best example of Amdahl's effort is the Multiple Domain Feature of its 580 and 5890 processors. MDF allows users to dynamically divide a single processor and allocate resources to two different operating systems. For example, a user could allocate the resources in a 5890/300 to up to four different operating systems without the substantial overhead burden that IBM's VM operating system requires to achieve the same split. Woodall is using MDF to carve out a portion of the 5890/300's processing capability for use in development work. "MDF lives up to its hype," he says.



WORLDWIDE PCM DISK-DRIVE MARKET

1985 Shipments in $ millions

Source: Disk/Trend Report

Vincent J. Gallo

Amdahl's processors may have more features than its competitors, but NAS and IBM offer bigger disk drives. NAS has been selling Hitachi's version of IBM's popular 3380 5-gigabyte double-capacity drives since April. Amdahl sells a 2.5-Gbyte Fujitsu drive, and will start shipping a double-capacity drive this fall. Unlike IBM's 3380, which uses thin-film heads, the Hitachi and Fujitsu drives use ferrite heads, an older technology.

"Thin-film heads weren't necessary for the 3380," says James Porter, editor of *Disk Trend Report*, Los Altos, CA. "There is no functional advantage to them, so the Japanese took the more conservative approach." That was a good decision for Hitachi, says Porter, since Hitachi brought out its drives early enough to capitalize on rising market demand for 3380s. The Japanese-made disk drives sold by NAS and Amdahl cost about 20 percent less than the IBM 3380.

HOW THE PCMs STACK UP

Vendor/ Product	MIPS	Price per MIPS	Memory (Mbytes)	Channels	Price*	Offered
Amdahl 5890						
200	27-29.7	$127,946-$141,666	64-256	32-64	$3.8	1Q87
300	36-39.6	$113,636-$125,000	64-256	32-64	$4.5	Now
600	58-63.8	$133,226-$146,551	128-512	64-128	$8.5	4Q87
NAS AS/XL						
50	15.5-20	$152,500-$196,774	32-256	16-48	$3.1	1Q87
60	23.3-29	$145,793-$183,826	64-256	24-64	$4.2	Now
80	42-50	$142,000-$169,047	64-256	24-64	$7.1	Now
90	58-70	$139,971-$168,350	128-512	48-98	$9.8	3Q87
100	73-98	$125,963-$169,209	128-512	48-98	$12.4	3Q87
IBM						
150	9.6	$177,083	32-64	16-24	$1.7	Now
180	15	$173,333	32-64	16-32	$2.6	Now
200	27.1	$166,051	64-192	32-48	$4.5	Now
400	47.3	$179,704	128-640	64-96	$8.5	Now

*In millions

Statistics supplied by vendors and Annex Research.

Of the single capacity 3380-type drives, NAS' drive has been the most reliable, says Larry Martin of Reliability Research, Norwalk, CT. IBM's 3380 was second in the reliability ratings for the past six months, he says, with Amdahl's drive third. After correcting technical problems, says Martin, Amdahl's drive has dramatically improved its performance; data for one month show Amdahl outperforming IBM. But, cautions Martin, one month is not long enough to be conclusive. "At this point," says Martin, "it would seem Hitachi [NAS] is clearly the IBM competition."

In both storage and processors, the plug-compatible vendors offer significant advantages. Plug-compatible boxes are smaller and cheaper to power. They also cost about 20 percent less. The question is whether the plug-compatible vendors can withstand IBM's aggressive pricing and still turn a profit.

Thomas Henkel, a consultant with the Boston-based Yankee Group, says users should expect normal price reductions of about 10 percent annually, but IBM will combine these cuts with added features for the 3090 that will increase performance. "NAS and Amdahl will have more to sell against, if that happens," says Henkel, explaining that it will increase the pool of potential customers. Henkel believes the plug-compatible vendors may also provide similar performance increases. "They can keep up with this generation of IBM mainframes." ☐

(Continued on page 34)

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NOVEMBER 18, 1986

- E-mail boosts micros
- Remote LAN access
- Streamlined Cobol
- Online monitors
- Time to board GM's MAP bandwagon?

COMPUTER DECISIONS

THE MAGAZINE FOR MIS EXECUTIVES
A HAYDEN PUBLICATION

WHEN THE BOSS DRIVES MIS

CEO Alexander Giacco uses information systems to steer Hercules Inc. and to check on performance.

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MIS chief Ross Watson (left) has shaped Hercules' sales inquiry system to fit Giacco's vision.

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47 An LAN isn't always local/With remote access software and some modems, users thousands of miles away can tap into local-area networks

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32 Inside track/Alexander Giacco and Ross Watson prove that a professional investment in one corporation can pay off.

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34 Use of C on mainframes gets IBM's endorsement/IBM's introduction of a C compiler may encourage broader use of the language on mainframes, especially in integrated shops.

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Computer Decisions (USPS 771-040 ISSN 0010-4558) is published biweekly except three issues in September and October for $65 per year by Hayden Publishing Co., Inc., 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address change to *Computer Decisions*, P.O. Box 1031, Southeastern, PA 19398. For subscription information, please call (215) 337-8623.

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INSIDE MFG.

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32E Expert systems' timely clock-in at the factory/Expert systems that bring artificial-intelligence technology to the factory may be the latest breakthrough in manufacturing systems.

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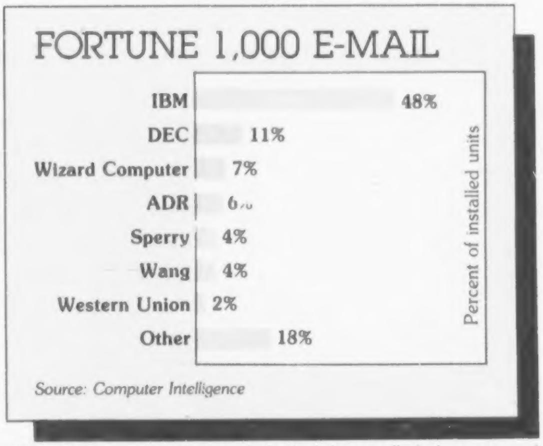
as change their size and frequency depending on network loading allow for the integration of voice, data, and video information over the WPT network. ☐

PC AT desk-top clone

AST Research Inc., the leading supplier of micro expansion boards, introduced an IBM Personal Computer AT clone that it is selling as part of a low-cost desk-top publishing system.

The Irvine, CA-based vendor is packaging the new Premium/286 with its Turbolaser laser printer and Turboscan optical page scanner to form the Premium Publisher system. The complete system with monochrome monitor costs $9,995 without software. Without the scanner, it costs $7,995. That price is "amazing" compared with the more than $10,000 price of a similarly configured IBM PC XT and a Hewlett-Packard Laserjet Plus printer, says Datapro Research Corp., Delran, NJ.

Analysts see AST's move to micros and desk-top publishing as a response to disappointing financial performance. Profits in the most recent quarter dropped by $5 million, about 60 percent from the previous year. Safi Qureshey, AST's president, attributes sagging performance to the low profit margins of several new products, the manufacturing costs of which the vendor has not yet begun to reduce, and to lower sales of the Six Pak Plus expansion board. That product accounted for 49 percent of AST's sales in the first fiscal quarter of 1986, but only 14 percent for the first quarter of 1987, notes Gartner Securities Inc., Stamford, CT. ☐



Source: Computer Intelligence

IBM's Profs accounts for nearly half of the installed electronic-mail systems in Fortune 1,000 corporations with IBM mainframes. Digital Equipment Corp.'s All-in-One ranks a distant second.

"Breakthrough" terminal offers high resolution at low price

"It's a breakthrough," says analyst Ilene Goldman of International Data Corp. (Framingham, MA) about the new Visual 600 Series terminals Visual Technology Inc. (Lowell, MA). Goldman praises the new terminals for offering full-function alphanumeric and high-quality graphics for $695.

The Visual 600 Series terminals include a "plain vanilla" display and removable cartridge unit for changing terminal emulation characteristics. The terminals can be easily reconfigured to address a number of terminal standards, including ASCII and DEC/ANSI, as well as to accommodate PC-compatible and high-level Tektronix 4010/4014 graphics applications. Unlike many higher priced competitors, the Visual models provide a flicker-free screen.

The series is expected to ship in early December. ☐

A 9,600-bps modem for under $1,000—without the echo

US Robotics Inc.'s new Courier High Speed Technology (HST) modem is a full-duplex 9,600-bit-per-second machine for use on dialup phone lines that costs only $995.

The new modem is substantially cheaper than other 9,600-bps modems, which can cost $2,500 more. A US Robotics spokesperson says the cost savings stem from eliminating echo cancellation. Echo cancellation, part of the CCITT's V.32 recommended standard, allows each modem to ignore its own transmitter and pick up the remote transmitter. "We have completely separate channels," the spokesperson says, "so there is no echo to cancel." The Courier HST provides simultaneous 9,600-bps and 300-bps data channels and automatically assigns channel direction according to data flow. The Skokie, IL-based manufacturer claims the new modem is ideal for interactive applications, and is lobbying to have it accepted as an international standard. ☐

Datapoint tries again

Datapoint Corp. has announced a series of new systems and workstations that, according to president Edward P. Gistaro (pictured), puts it in contention with—and makes it compatible with—the major vendors of office systems.

Expanding on its Minx teleconferencing workstation, which 18 months after its introduction can only claim "more than 200 and less than 1,000" installations, Datapoint announced the multifunction Starcluster workstation. Starcluster, at a pricey $25,000, offers voice, office, and dp applications plus videoconferencing. It connects to the Starship II multiprocessor, which, at 3.2 million instructions per second, is comparable to IBM's 4381 or the DEC VAX 8550. Starship II, with a meld of peripherals, costs $79,000.

Peter Silva/Picture Group

Gistaro also reported sound balance sheets and two profitable quarters in a row for Datapoint. Nevertheless, Gistaro projects flat revenues ahead for the San Antonio, TX-based mini vendor. ☐

FOLLOWING THE LEADERS

Hayes Microcomputer Products Inc.

Dennis Hayes, chairman, president, and CEO of Hayes Microcomputer Products, bases his corporation's success on outstanding customer service.

LEGEND MEETS REALITY

Hayes Microcomputer Products' dominance in micro modems has become virtually legendary. But is reality catching up with the legend?

by David Morrison

In less than a decade, Dennis Hayes, the 36-year-old chairman, president, chief executive, and principal stockholder of Hayes Microcomputer Products Inc., has taken his modem business from a garage enterprise to a $150 million-a-year corporation. The Hayes name has become so synonymous with micro modems that even IBM advertises compatibility with Hayes' products—not the other way around. Hayes' challenge is to maintain that position.

Analysts describe the vendor's early growth as spectacular, enjoying triple-digit growth rates and an undisputed role as the leader in micro modem development and sales. But now, in its 10th year, the corporation faces narrowing profit margins, increased competition, and the uncertainties of a rapidly changing technology.

Norcross, GA-based Hayes has dominated the micro modem market since 1981. Following the development of its highly successful 300-bps and 1,200-bps Smartmodems for IBM and Apple Computer Inc. micros and the popular Smartcom menu-driven communications software, Hayes held 65 percent of the $161.5 million national micro modem market in 1984, says Dataquest Inc., San Jose, CA, market researchers. But the vendor's share dipped to 47.7 percent of the $216.5 million 1985 market. Hayes remains far ahead of its closest competitors, but that gap may be narrowing.

Last year was a difficult one. Hayes lagged behind other vendors in bringing out a 2,400-bps modem, not introducing it until the end of 1984. The corporation's attempt to broaden its product line with Please, a user-friendly database management package, flopped. And in spite of comparable communications hardware available at a fraction of the cost of Hayes products, the Smartmodem remains "pricey," says Andrew Clark of Walter Ulrich Consulting Inc., Houston. Although Hayes recently reduced the price of its 2,400-bps modem to $695, its competitors offer similar products for $515 or less.

As a result of these setbacks, Hayes was forced to put all employees on an involuntary four-day furlough without pay at the end of last year and cut its marketing and manufacturing staff by 125 employees earlier this year. But Dennis Hayes insists that his company is stronger than ever. "The slump in the market gave us a chance to catch up with ourselves," he says. "Now I see us as being very much like a coiled spring, ready to grow."

> "When I started this company, I never intended it to be a small company."
> *Dennis Hayes*

Because Hayes Microcomputer Products is privately owned, it is not required to report balance sheet information. According to industry analysts, however, it is relatively debt-free with estimated sales of about $135 million last year. As such, Hayes would make an attractive candidate for acquisition, say observers. But Hayes, who controls an estimated 90 percent of the corporation's stock, insists that selling the business is out of the question.

Nor is there likely to be a public offering of Hayes stock, the remainder of which is owned by employees through a profit sharing plan, Hayes says. "We want to remain privately owned," says Hayes, who claims he would waste too much time dealing with stockholders and securities analysts. "We're in the business of selling our products. We're not interested in selling our business."

Analysts are predicting sales of at least $150 million for Hayes in 1986. Dataquest forecasts continued total market growth to $1.13 billion in sales for 1990. That will represent shipments of more than 4 million modems in 1990 compared with the 1.06

million expected to be shipped this year.

The downside, at least for Hayes, is that the average price per unit, $279 in 1986, is expected to drop to a margin-squeezing $266 in 1988 before rising back to $278 per unit in 1990.

In addition, some of Hayes' competitors have launched what appears to be an all-out price war to carve out a bigger share of the market for themselves. 1,200-bps modems are already on the market for about $150, compared to $595 for the Hayes 1,200-bps modems. Leading Edge Products Inc. (Canton, MA) offers its Model L 1,200 B internal modem for $149; the Hayes equivalent is $495. Hayes officials argue, though, that these products are not backed up by the liberal warranty polices and extensive support network Hayes offers.

Dennis Hayes also expects to gain sales overseas, which he says will also strengthen his hand when dealing with the multinational corporations that have been among his best customers in the United States. The vendor has already established offices in the Far East and Europe and has overcome some of the trade, political, and technological barriers in dealing with government-controlled telecommunications operations in other countries.

Hayes refuses to reveal future product strategies, but says he is investigating ways to expand the vendor's presence in the public packet-switched market, develop protocol converters for micros, and develop higher-speed modems. Hayes does not yet market a 9,600-bps modem as some of its competitors do.

Hayes does say that one of his priorities is to maintain the corporation's reputation for customer service that has contributed to its preeminent market position. The vendor does not quibble over technicalities in its limited warranty, Hayes says, and will answer any customers' questions it can, even if they are about other vendors' products. "We want users to be successful in using modems," said Hayes. "That's the key to our success."

That success may be one of the vendor's greatest liabilities. Competitors have successfully emulated Hayes products using lower-cost technologies and manufacturing flexibilities. For instance, competitors were able to beat Hayes to the market with a 2,400-bps modem. Jerry Sanders, chief of the technical support branch of the Atlanta-based Center for Disease Control's information resources office, switched to Hayes-compatible U.S. Robotics 2,400-bps modems because they were readily available.

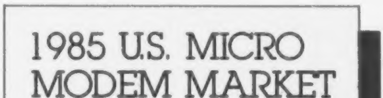
Despite its lateness in entering some modem markets, Hayes remains leader of the pack when it comes to reputation for quality. "When my rear is on the line, I'm going to go with something that works," says Larry C. Rogers, personal-computer analyst in the information center of the Atlanta-based National Bank of Georgia.

> "The slump in the market gave us a chance to catch up with ourselves. Now I see us as being very much like a coiled spring, ready to grow."
>
> *Dennis Hayes*

With more than 100 micros in the bank relying on modems for downloading data from computers at the Federal Reserve Bank, obtaining real-time stock quotations and sending all sorts of reports back and forth from computer to computer, "It's going to take something that will really blow the world away in terms of cost or performance," Rogers says, to convince him and his users to drop Hayes.

A recent survey of 542 communications managers by Datapro Research Corp., Delran, NJ, showed that both the Hayes 1,200-bps and 2,400-bps modems scored high in ease of installation and reliability. The overall rating of 3.3 and 3.2, respectively, out of 4 is "very good," Datapro says.

Jack Musgrove, associate director of Dataquest, says "Hayes seems to be doing just fine" in the micro modem market and predicts that the corporation will maintain its position as market leader. But, he adds, over the long haul Hayes will have to respond to the lower-priced entrants making headway in modem sales.



Susan Banta

Despite recent setbacks, Hayes Microcomputer Products Inc. is still far and away the preeminent player in the micro modem market.

With that in mind, Hayes "is going to face a lot of pressure to maintain profitability," says consultant Clark. "It's going to have to sell a lot of modems to make money if it's basing its profits on the modem market alone," he says. "It's one thing to sell a lot of modems at $700 and see margins of $200 to $300, as Hayes has done in the past. It's a lot different when you have to sell a modem for $150 with a margin of $50."

Hayes has had some difficulty in adding new product lines. Please, a low-end DBMS, had a less-than-auspicious beginning when it was introduced on the same date as a long-awaited upgrade of dBase III. Although the easy-to-use Please is still on the market, it is the only product that Dennis Hayes will admit has lost money. The "jury is still out," he says, on products like Transet 1000, a buffered interface card, and other recent launches, says Hayes.

The corporation is also trying to become more responsive to the needs of major corporations by enhancing its existing product line. For example, while pressing to have its own Hayes Verification error-checking communications protocol established as the industry standard, Hayes is gradually supporting other protocols with its products, including those developed by competitors. It has also started addressing the integration of modems into local-area networks with a version of Smartcom II for IBM-based LANs and Interbridge, a local and remote hardware connection for Appletalk Personal Networks.

Although Dennis Hayes appears to be wearing all the hats in the corporation, he is well aware of the dangers of spreading himself too thin. Consequently, he claims, he has built a strong management team. But Hayes insists he's not likely to step down anytime soon. "I enjoy what I'm doing," he says. "My vocation and avocation are the same." And, he says, he has not quite finished what he set out to do. "When I started this company," Hayes says, "I never intended for it to be a small company." ☐

David Morrison is a free-lance writer based in Atlanta.

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DECEMBER 2, 1986

- Project potential
- Optical storage now
- How MIS brings in relational DBMS
- Voice mail catches on
- CA builds on utilities

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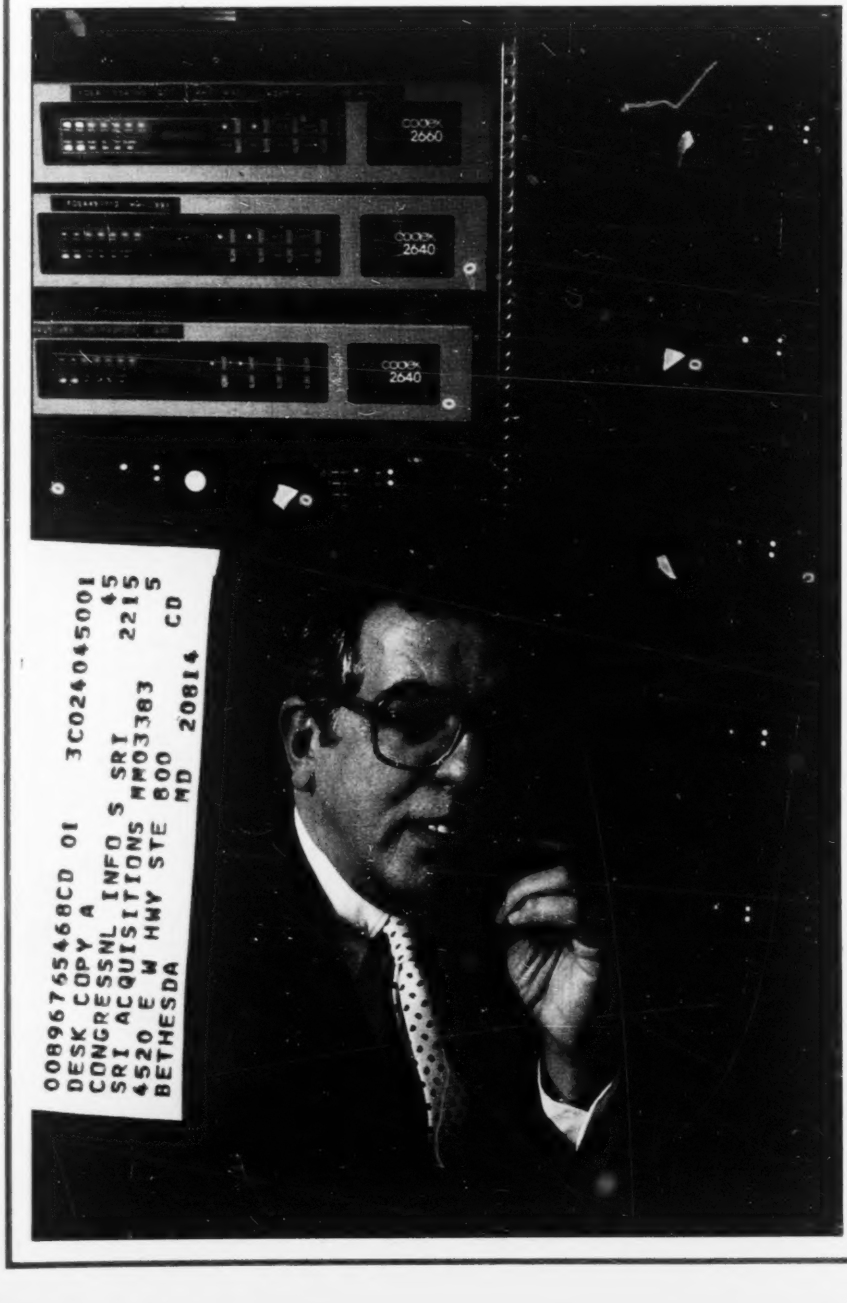

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MIS BETS ON SMART NETS

MIS executives overseeing big private networks hope expert systems will automate network management and cut costs.

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Can a $200,000 expert system automate network problem resolution? Metropolitan Life's MIS boss Daniel Cavanagh intends to find out.

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Cover photo: Ted Hardin

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Computer Decisions (USPS 771-040 ISSN 0010-4558) is published biweekly except three issues in September and October for $65 per year by Hayden Publishing Co., Inc., 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address change to *Computer Decisions*, P.O. Box 1031, Southeastern, PA 19398. For subscription information, please call (215) 337-8623.

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Copies printed: 181,659

my name. I happily went up and accepted my prize."

Unisys was only one of 300 names submitted by Machen. "I wasn't the only one that submitted numerous suggestions," he notes. "A fellow employee submitted 2,000 entries and used a computer program to generate different names. My ideas came from my own head." ☐

Multiuser micro boom?

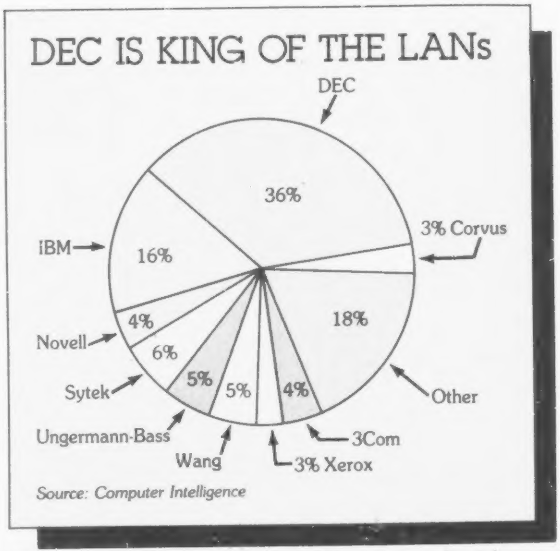
Forget the Intel 80386's increased speed and power. The most immediate benefit from the 32-bit chip, say many vendors, will come from its virtual machine mode function, which will efficiently allow multiple users to access MS-DOS applications running on one 386-based micro.

"The 386 signals the beginning of a multiuser boom," asserts Susan Catalano, president of Theos Software Corp. (Lafayette, CA). The vendor previewed Theos 386 and Theo DOS, new systems software for the 386, at last month's Comdex.

Although multiuser applications have been available for micros running under AT&T's Unix and Xenix from Microsoft Corp. (Redmond, WA), many users want multiuser capabilities for the more popular and prominent MS-DOS applications. Up to now, providing multiuser versions of MS-DOS software involved inelegant and costly solutions, such as attaching each terminal to a dedicated processor board on a shared micro.

Theos' new operating systems, as well as PC-MOS/386 from The Software Link Inc. (Atlanta), promise to unlock the functionality of the 386's virtual machine mode and should allow as many as 20 MS-DOS applications to run concurrently at top speed, the vendors say. In effect, virtual mode turns inexpensive dumb terminals into 8086 micro clones, says Phil White, president of San Jose, CA-based Wyse Technology. Wyse showed a beta-test version of a 386-based micro at Comdex.

Other vendors demonstrating 386 machines priced from $5,000 to $7,000 at Comdex included Convergent Technologies Inc. (San Jose, CA), PCs Limited (Austin, TX), Kaypro Corp. (Solana Beach, CA), Multitech Electronics Inc. (Sunnyvale, CA), Zenith Data Systems (Glenview, IL), Laser Digital Inc. (Sunnyvale, CA), and Goldstar Co. Ltd. (Sunnyvale, CA). Rexon Inc. (Simi Valley, CA) introduced a multiprocessor 386 machine accommodating up to 120 users for roughly $50,000. ☐



Source: Computer Intelligence

DEC's 36 percent share of the networks in a survey of mainly IBM mainframe sites gives credence to DEC President Ken Olsen's claim that his is "the" networking company. But there's hope for IBM: The survey also found that 31 percent of the respondents plan to install IBM LANs, but this still trails the 40 percent who plan to install DEC networks.

Memorex gets dismembered

Unisys Corp. (Detroit) agreed to sell for an estimated $550 million much of its Memorex Corp. subsidiary to a group of Memorex executives and New York investor Eli Jacobs.

Unisys will still use Memorex's manufacturing facilities in Santa Clara, CA, to make IBM plug-compatible disk drives for the new Memorex, which will be headquartered in London. It will also use the plant to make disk drives for Burroughs and Sperry Corp machines.

Analysts see the sale as part of a plan by Unisys to reduce the debt incurred in financing the $4.8 billion purchase of Sperry Corp. by Burroughs. ☐

DEC maps out connections

DEC's new network based on the Manufacturing Automation Protocol is the first full implementation of the standard by a major dp vendor.

VAX DEC/MAP allows users to run applications for a DECnet network and a MAP network serving factory devices in parallel on the same broadband cable. According to the vendor, data can be moved from DECnet to MAP through a host VAX if users write appropriate procedure calls. For example, users of Baseway, DEC's facility for machine tool programming, can transfer Baseway instructions from DECnet to DEC/MAP, although Baseway itself can't run on the MAP network.

VAX DEC/MAP is a full implementation of MAP Version 2.1, including protocols allowing for peer-to-peer communications. Of the seven layers of protocols in MAP, only two—those governing the physical connections—are implemented in hardware, on a special MAP modem from Concord Data Systems Inc. (Waltham, MA). The remainder are implemented in software running on a MAPserver/Plus Token Interface Module that runs in the host VAX.

VAX DEC/MAP required MAPserver/Plus TIM software and cabling ($12,000 to $16,500) and a Concord MAP modem ($5,745). Included in the price is network management software. The product will be available in January. ☐

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DECEMBER 16, 1986

- IBM's DEC strategy
- LANs mix it up
- The coming micro software explosion
- Manufacturers look again at MRP II

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THE MAGAZINE FOR MIS EXECUTIVES
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THE YEAR OF THE SUPERMINI

MIS executives now have their choice of superminis and "seamless integration" strategies from all the major supermini vendors.

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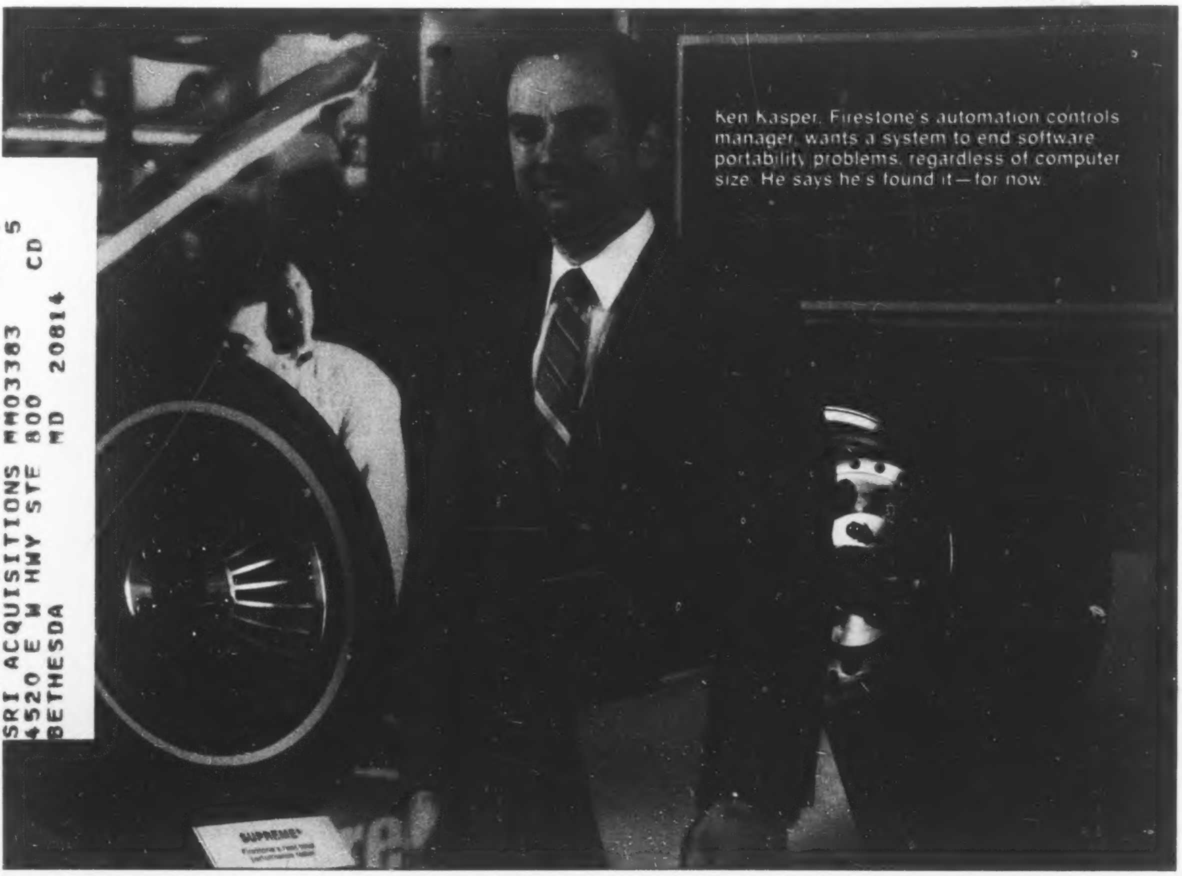

Ken Kasper, Firestone's automation controls manager, wants a system to end software portability problems, regardless of computer size. He says he's found it—for now.

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Cover photo: Jake Ragan/Studio R

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INSIDE MFG.

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Computer Decisions (USPS 771-040 ISSN 0010-4558) is published biweekly except three issues in September and October for $65 per year by Hayden Publishing Co., Inc., 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address change to *Computer Decisions*, P.O. Box 1031, Southeastern, PA 19398. For subscription information, please call (215) 337-8623.

STRICTLY SOFTWARE

43 MRP II: A shop floor savior?/MRP II software is gaining more functions to help keep American manufacturers competitive—but gaps remain.

45 JITware: MRP II meets JIT/Vendors of MRP II packages are rushing to add modules that support just-in-time inventory management methods.

DEPARTMENTAL COMPUTING

48 Spotlight on printers/Lasers are getting all the attention, but users are also benefiting from many advances in older printing technologies.

CIO

52 It's Me Inc. vs. You Inc./It may be every employee and corporation for itself, but MIS executives can still engender loyalty in dp pros.

Copies printed: 181,689

as high as that for MIS pros in the same organizations. The Diebold Group interprets this as an indication of the high demand for telecomm experts.

- Only 27 percent of the corporations surveyed bypass the public long-distance network. Only 24 percent bypass the local public phone network. ☐

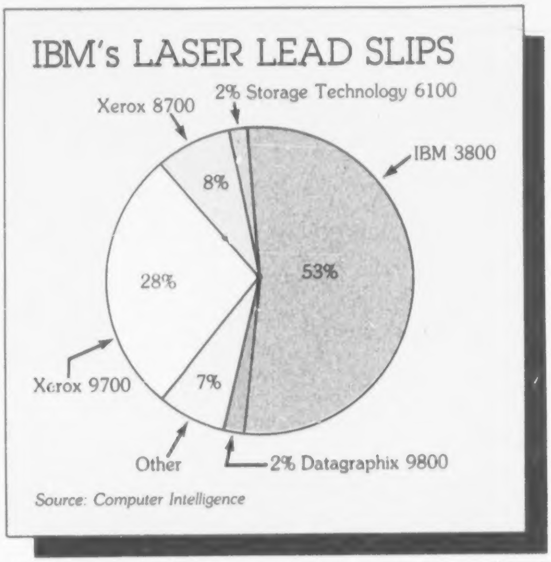
IBM leaves 'em guessing

IBM's decision to relax penalties imposed on Hitachi Ltd. as a result of a 1983 settlement of IBM's industrial espionage case against Hitachi has left some observers wondering.

"The timing of it is strange because it comes at the same time Hitachi is looking into directly marketing products in the United States," says IBM-watcher Brian Jeffery of the Los Altos, CA-based International Technology Group. "It looks as if IBM is opening up the door to Hitachi." The giant Japanese computer maker is currently considering whether to market workstations under its own label, but a Hitachi spokesman says it has no plans to market large systems in the United States.

IBM's new agreement with Hitachi virtually eliminates Hitachi's payments to IBM of between $3 million and $6 million a month. Hitachi was forced to make the payments after pleading guilty to charges in 1983 that it stole IBM operating system software code. Relaxation of the penalties appears to settle the dispute. A Hitachi spokesman says Hitachi has rewritten its software code.

Jeffery theorizes that IBM may have been forced into a settlement to prevent a legal confrontation between the Japanese government and IBM Japan, a primary supplier of mainframe systems in that country. But if IBM did settle the dispute to prevent itself from being charged with anti-competitive practices in Japan, why is it pursuing its legal battle with Fujitsu, the other major Japanese manufacturer of mainframes, Jeffery wonders. Last year, IBM charged Fujitsu with copying its software, and it has reiterated that it is pursuing the matter before an international arbitration panel. "The disparity between the two cases makes it even more curious," says Jeffrey. "There seems to be more here than meets the eye." ☐


IBM's LASER LEAD SLIPS

Source: Computer Intelligence

IBM's lead in the large-system page-printer market has slipped slightly—to 53 percent from 59 percent in 1985—according to Computer Intelligence's latest survey of IBM and PCM users. The market researcher reports, however, that IBM retains an 80 percent share of the IBM/PCM line-printer market.

Honeywell's three flags

Honeywell users will soon be getting to know a supplier with a new name. Faced with an eroding user base, Honeywell has turned its users over to a still-unnamed partnership between it, Compagnie des Machines Bull of France, and NEC Corp. of Japan. The basis for the new corporation will be Honeywell Information Systems.

Honeywell will hold a 42.5 percent share of the new corporation, equal to Bull's share, but analysts expect the Minneapolis-based vendor to eventually either dramatically reduce its stake or sell out entirely. "In the long term, they'll sell it," says Michael J. Geran, an analyst at E.F. Hutton & Co., New York.

The implications of the deal for Honeywell users were not clear at press time. However, analysts expect the new corporation to maintain and add to current Honeywell product lines. Bull manufactures Honeywell's DPS-7 mainframe and NEC contributes the top-of-the-line DPS-90 mainframe. The main product of Honeywell Information Systems is the DPS line of minicomputers.

Analysts say the low price Honeywell will receive for its information systems division is a reflection of the impending tax law changes. However, they also believe Honeywell was eager to dump its ailing computer business. "Honeywell's base is eroding," says Steven Milunovich, an analyst at First Boston Corp., New York.

The deal will give Honeywell approximately $500 million in March, according to the vendor; the net book value of Honeywell Information Systems was $900 million, excluding the federal systems operation Honeywell will retain.

Honeywell officials portrayed the deal as a chance to concentrate on marketing and systems integration. Honeywell's willingness as an integrator to work with other vendors' equipment is still unclear. It has been selling limited amounts of equipment from IBM, Digital Equipment Corp., and others to the U.S. Department of Defense, says Geran. For the moment, however, Milunovich expects Honeywell to sell Honeywell computers. After all, he notes, it isn't quite free of its computer business. ☐

(Continued on page 12)

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JANUARY 12, 1987

- Artificial intelligence
- Mainframes and minis
- SNA and OSI
- Mass storage
- High-performance micros
- Office technologies

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16 X.25 data networks and IBM: A troublesome connection

18 IBM and X.25: A different twist

20 All not for one WP standard

22 Yes, there is a cheap fiber LAN

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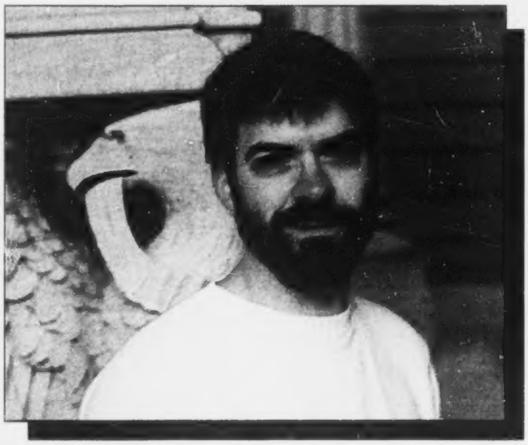
24 Heeding the call to distribute/A simple matter of programming—that's what IBM calls the key to a distributed network architecture. But if it's so simple, what's taking so long?

STRATEGIC SYSTEMS

30 The watchword is renovation/IBM's plans for its next Sierra offering are emblematic of the trend in large-systems technology: Vendors are fine-tuning, not innovating.

STRICTLY SOFTWARE



36 Look for smart systems/MIS can expect to see AI more integrally related with conventional business applications.

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DEPARTMENTAL COMPUTING

40 Moving ahead—sort of/Departmental computing has taken some unexpected turns, and new developments pose technical and organizational challenges to MIS.

MICRO DECISIONS

45 Power in search of purpose/Unprecedented power. Limitless applications. Once DOS catches up, the 80386 micro will introduce a new era in corporate microcomputing.

51 Engineering a 386 CAD/CAM connection/The wait for engineering software written specifically for the 386 will extend into next year—or longer.

Cover illustration:
Harold Brooks

Copies printed: 181,689

Upgrading from DEC's new VAX 8300 to the VAX 8500 also requires the purchase of a new machine. The MV/15000s are not upgradable to the top-of-the-line MV/20000s, however.

Although the MV/15000 offers approximately the same MIPS power as Data General's MV/20000 Model 1, the base prices for the MV/15000 series are $40,000 to $50,000 cheaper, according to the vendor. However, the Model 1 offers 64 Mbytes of main memory and approximately 30 Mbytes of input/output bandwidth—twice as much bandwidth and main memory as that offered in the new series. In addition, the Model 1 can be upgraded to the dual-processor MV/20000 Model 2, which competes against the DEC VAX 8800. ☐

A better X.25 link to come?

Reaping the benefits of X.25 communications may get a lot easier for IBM users in 1987. NCP Packet Switching Interface is a weak product that will be replaced by a full release of X.25, "maybe as early as this month," speculates Rudolf Strobl, senior communications analyst with Arthur D. Little Inc., Cambridge, MA. The "mature X.25 product" has reportedly been available to European users since 1984. Although those in touch with European users say the new X.25 product is stronger than NPSI, it remains to be seen how well the product will work with the U.S. implementation of X.25 (see related News Analysis story on page 16). ☐

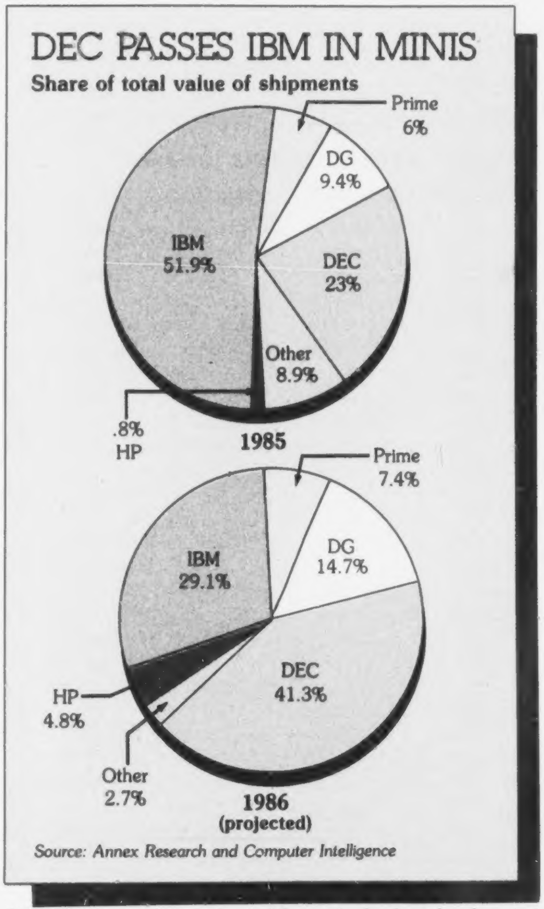
Silence can be patented

A competitor has charged that Hayes Microcomputer Products Inc. is trying to edge out other manufacturers by patenting two seconds of silence.

In a suit against Hayes and another manufacturer that has patented software that controls Hayes modems, U.S. Robotics Inc. (Chicago) contends that the two vendors are trying to monopolize the market with frivolous patents. The Hayes modem command set is a de facto industry standard.

The U.S. Patent Office granted Hayes a patent in 1985 for "guard time," a period of silence that envelops one command so that it's not mistaken for a string of ordinary text. U.S. Robotics claims that royalty payments to Hayes and Bizcomp Corp. (Sunnyvale, CA) for guard time could amount to as much as 5 percent of its sales, which it says is a significant sum.

Hayes declined to comment on the suit. U.S. Robotics made similar charges in a suit brought against Bizcomp in 1984. Bizcomp holds a patent for another part of the command set that controls the Hayes modem. Michael Eaton, president of Bizcomp, says the patent office has twice upheld Bizcomp's patent. Paying royalties on modem patents is not unusual, he says, adding that Bizcomp pays as much as 6 percent in royalties to AT&T for technology used in one of Bizcomp's modems. Eaton believes U.S. Robotics is pressing the suit as a delaying action to avoid paying royalties. ☐



Source: Annex Research and Computer Intelligence

Digital Equipment Corp.'s share of the total value (based on list price) of projected 1986 minicomputer shipments is expected to rise to 41 percent from 23 percent in 1985. IBM's similar share is projected to drop to 29 percent from 51 percent. The 1986 projection is based on shipments during the first six months of 1986, before IBM announced price/performance improvements in the System/3X line.

Go ahead ... make my day

At the Bullet Stop in Marietta, GA, customers fire live ammo from M-16 and Uzi machine guns at products they hate. The most popular targets: computers.

One frustrated user brought in a computer, "shot the hell out of it," then put it in a box and sent it to the manufacturer, says Paul LaVista, owner of the shoot-'em-up emporium. Among LaVista's computer-hating customers was one woman who blew her micro away because she was unhappy with the results of a budget she developed on it. Computer makers are getting in on the act too, LaVista notes. One micro vendor filmed the icing of an IBM machine for a television commercial. ☐

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JANUARY 26, 1987

- Measuring programmer productivity
- IBM's SNA signals
- Down-to-earth AI
- Data tamers
- Publishing power

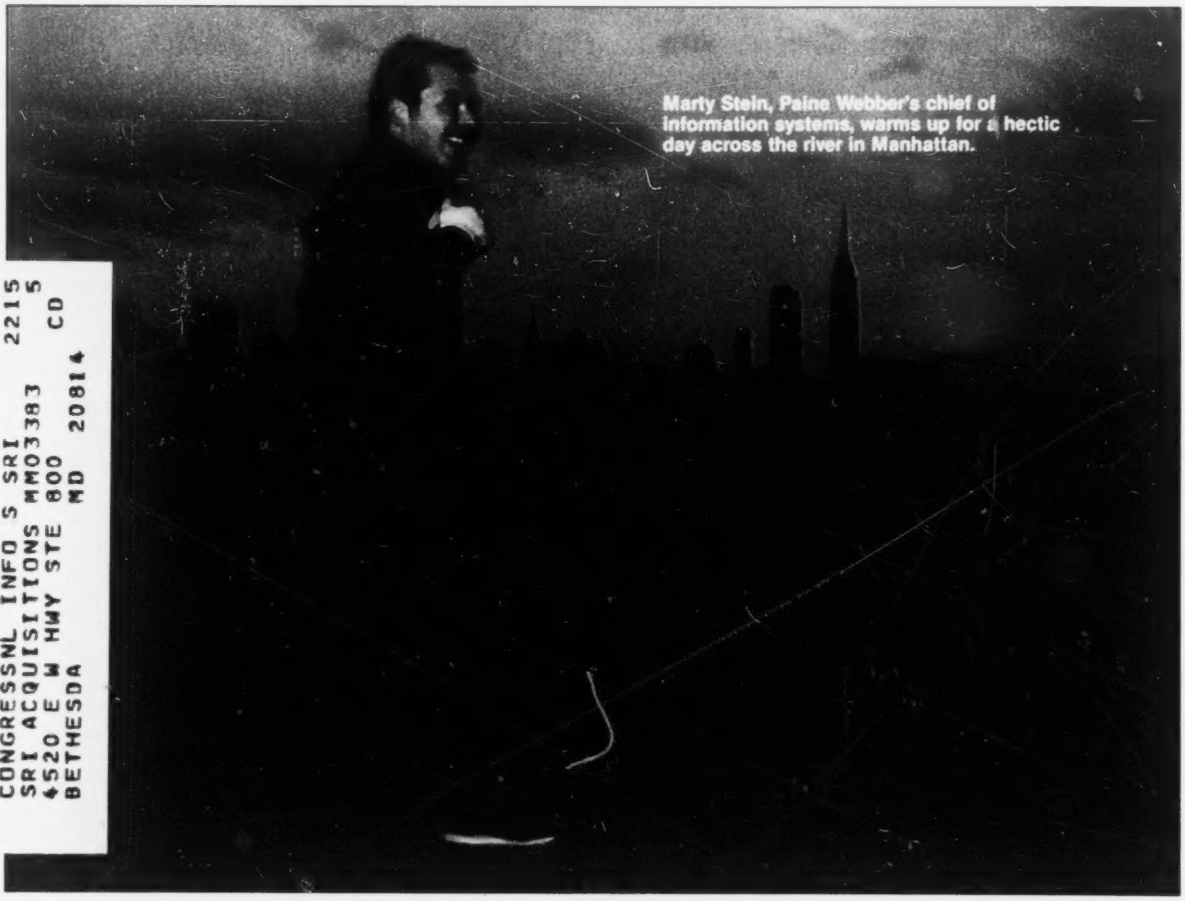
COMPUTER DECISIONS

THE MAGAZINE FOR MIS EXECUTIVES
A HAYDEN PUBLICATION

RUNNING FOR THE GOLD

On Wall Street, MIS executives start the day running, and they can't stop. But for survivors, the Street is paved with gold.

PAGE 28



Marty Stein, Paine Webber's chief of information systems, warms up for a hectic day across the river in Manhattan.

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Two ways fiber can be tapped

15 Users laud honey of an alliance

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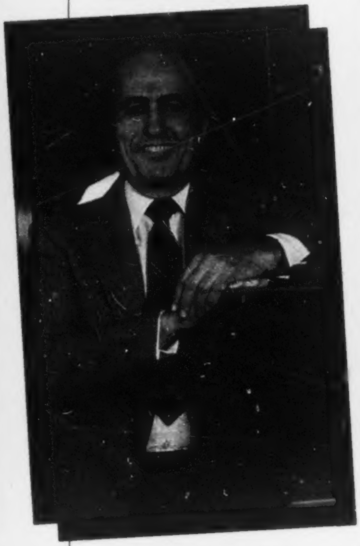
20 New IBM plan puts users to the test

24 Stacking up AI's vendors

STRICTLY SOFTWARE



32 A measure of programming/Function point analysis offers MIS managers a reliable way to measure programmer productivity—and to end beat-the-clock development.

MICRO DECISIONS

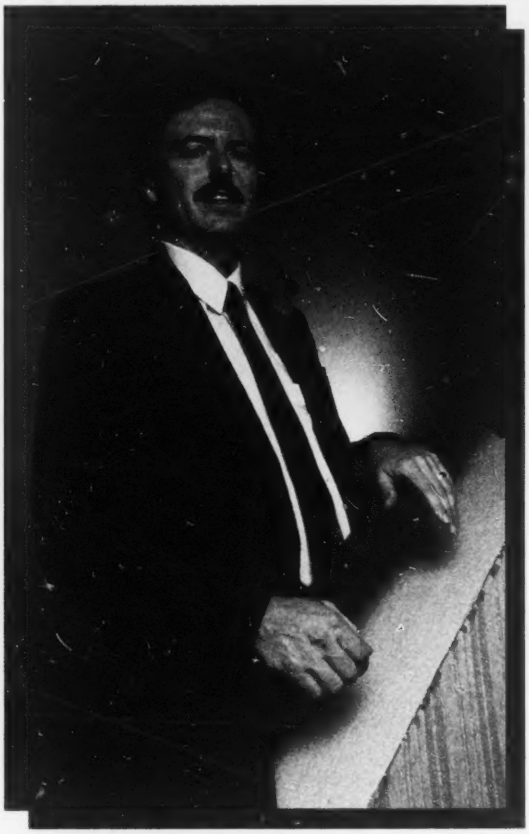
37 Data tamers/Micro-to-mainframe links give micro users easy access to mainframes. Now MIS needs to give users more control over mainframe data.

CIO

Cover Story

28 The Super Bowl of MIS/On Wall Street, MIS is a pressure cooker, and the executives who manage information systems are a breed apart. Cover photo: Ted Hardin

NETWORKS & COMMUNICATIONS



45 Which way is SNA going?/IBM is revolutionizing SNA's basic structure, but not all of the new SNA products are key to the future.

FOLLOWING THE LEADERS

47 Out of the ivory tower/The major AI software developers are leaving the laboratory and turning their attention to the real-world demands of corporate MIS.

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INSIDE MFG.

(Appears in selected issues)

48A Just-in-time none too soon/With just-in-time methods, motorcycle maker Harley-Davidson not only survived but now thrives among its Japanese competitors.

STRATEGIC SYSTEMS

50 Make a third-party deal/Independent maintenance vendors may provide lower costs and faster response than major manufacturers—plus blanket coverage of mixed systems.

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48G Application/ABC tunes in with Strobe

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Copies printed: 182,191

(Continued from page 10)

Oh, those !#? dirty rats

Here's another reason to enforce the long-standing prohibition against food in the data center: Food particles are attractive to rodents that may nest in pleasantly warm equipment.

This is just what happened about two years ago at a data center near the docks of Buenos Aires, Argentina. The data center belongs to CPC International, a multinational food processing giant. Computer center operators taking coffee breaks at their posts spilled crumbs from sandwiches and crackers. This attracted rats, which nested and defecated on crucial connections, shorting them out, according to a senior CPC official.

The solution was simple: installation of an ultrasonic sound device that drives the rats bats but is unheard by humans. ☐

A cheap and easy PBX/LAN

Telegence Corp. claims to have cut the price of sending data over existing telephone wires by as much as 80 percent with a new combination data PBX and micro local-area network that supports data speeds of up to 1 Mbit per second.

Instead of transmitting digital impulses over telephone wires, as AT&T's Starlan LAN does, Tokenstar converts digital transmissions from micros or asynchronous terminals to high-frequency analog transmissions. Voice conversations aren't interfered with. Tokenstar costs from $130 to $695 per connection, according to Telegence, a Westlake Village, CA-based startup. The PBX/LAN does not yet support synchronous (IBM 3270) communications.

Riverside, CA-based consultant Courtney Klinck sees Tokenstar's widest appeal as a low-cost, easy-to-install data PBX for those parts of corporations in which wiring and communications expertise is at a minimum. Tokenstar consists of book-sized boxes that plug into telephones and a hub that sits in a wiring closet a maximum of 1,000 feet away from a phone. The hub separates data transmissions from voice transmissions. Up to 250 users can be accommodated on the PBX/LAN. Call (213) 877-0337 for more information. ☐

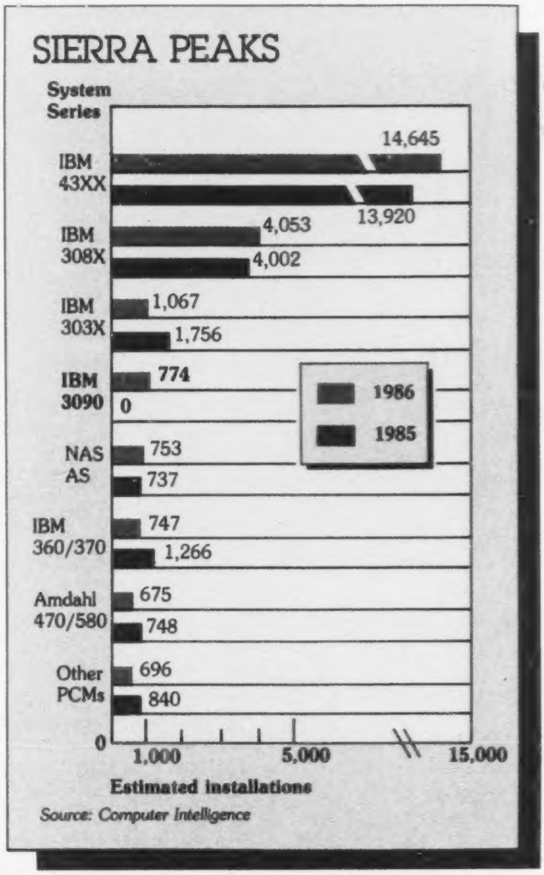
Micro monitor for cpus

Axios Products Inc., a Hauppauge, NY-based software house, claims users can save up to 10 times the cost of capacity management for IBM mainframes with its new micro-based system.

Axios' Pilot/MVS and Pilot/CICS cost $3,500 each and provide functionality similar to that of the mainframe-based performance monitor and modeling packages currently available, the vendor says. Such tasks as determining the five key factors affecting cpu performance, which might take hours on a mainframe, take seconds on a micro with Pilot, claims David Kirk, president of Axios. The packages include templates for Lotus 1-2-3.

The micro packages run on IBM Personal Computers and compatibles with terminal emulation boards, and include mainframe and micro modules that massage data from existing data collection software. The software is designed to run with Axios' $4,000 Pilot/SMF, a mainframe package that organizes raw mainframe data.

Call (516) 348-1900 for more information. ☐



Source: Computer Intelligence

Denise Barbieri

The success of IBM's 309X "Sierra" mainframe class is evident in this estimate. After only one year of shipments, there are already 20 percent as many 309Xs as older 308Xs. Meanwhile, Amdahl suffered a 10 percent decrease waiting for shipments of its new 5890 series to kick in.

Supra rates high, by Codd

E.F. Codd, originator of the relational database model, recently determined that Supra, the database management system from Cincom Systems Inc. (Cincinnati), follows 32 of the 42 rules he currently uses to define the relational model. The score includes adherence to 10 of Codd's 12 basic rules.

According to Codd, president of The Relational Institute (San Jose, CA), Supra scored higher than any DBMS he has reviewed. Codd's score for IBM's DB2 was 23, including adherence to seven of the 12 basic rules. ☐

(Continued from page 20)

chart). To qualify for a network CSA discount, a user must operate a network command center with network monitoring functions. For systems CSA, a user must have a help desk and be engaged in problem determination and resolution and change control. IBM says system management facilities eliminate many service calls to IBM service centers and save IBM about 13 percent to 15 percent in service costs. The vendor asserts that CSA will allow it to pass those savings on to customers. IBM adds that most of its large users already have such facilities in place and should qualify easily for CSA.

To participate in CSA, users must have their maintenance facilities approved by IBM. IBM will charge users an initial assessment fee for the program: $3,500 per location for the computer system option, and $8,600 per location for the network option. Henry W. Stigler, director of service offering and special bids for IBM's National Service division, says that if a data center doesn't initially qualify, IBM will explain what needs to be done to pass the test. The user will then have three months to address shortcomings. IBM will conduct the follow-up assessment at no cost, Stigler adds. Under the terms of the CSA agreement, IBM also holds the right to make unannounced periodic audits of a data center to ensure that proper maintenance procedures are being followed.

One data center manager for a large utility, who requested anonymity, says the initial CSA fees are negligible to a large installation paying $600,000 for maintenance. "If a large installation can save $120,000, it will gladly pay an initial fee," the manager says. "And I guarantee most large installations will qualify without getting inspected. IBM knows our shop. We have IBM technicians here around the clock who know our procedures."

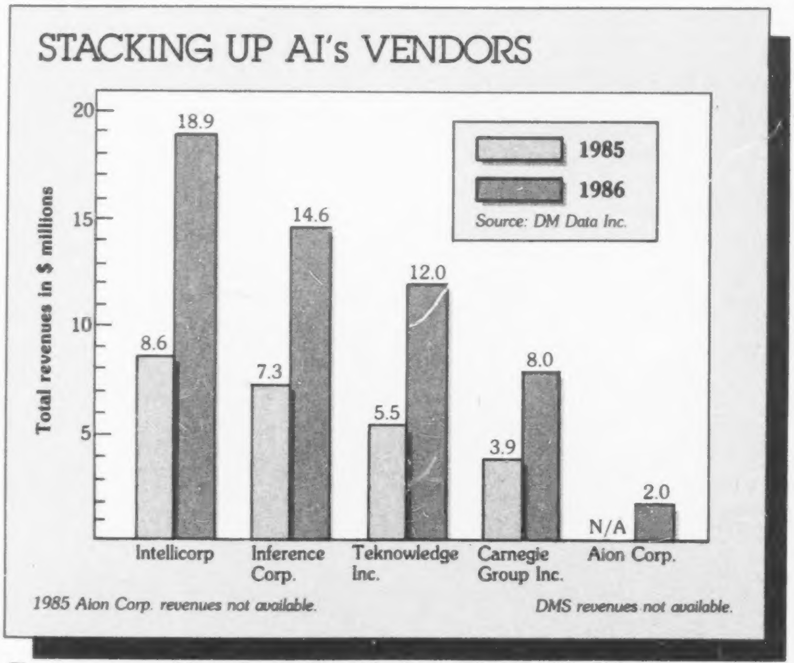
CSA roots. IBM has been building up to CSA for years, analysts say, through workshops offered to users on system and network management, and under the guise of two programs that also offered maintenance discounts to users who managed problems. The Enterprise Management Amendment (EMA), a pilot test first undertaken five years ago, offered discounts to 60 selected large customers. A second program, the Customer Managed Network Amendment (CMNA), offered discounts to 300 customers who signed up. Both EMA and CMNA are being terminated with the announcement of CSA. EMA and CMNA customers will be given a year to convert to CSA. Initial CSA assessment fees will be waived for these users, IBM says.

The origins of CSA can be traced more to EMA than to CMNA, says Donald Blumberg, a Fort Washington, PA, consultant specializing in service strategies. "EMA was limited to certain major national accounts that were required to sign up for longer terms," he notes. Although CSA does not require all IBM systems and network equipment to be included in the maintenance agreement, as EMA did, says Blumberg, "There is a tremendous economic incentive for the user to put all IBM equipment under the agreement. The greater the volume, the greater the discount." Blumberg estimates that large users can realize up to a 40 percent maintenance saving under CSA. He estimates that EMA users were getting a 15 percent to 20 percent discount.

A matter of size. IBM claims that CSA is not just aimed at large corporations. "Smaller organizations can benefit from putting systems management disciplines in place," says Stigler. "Our studies indicate that customers who do an effective job of systems and network management reduce their own service costs, increase the reliability and throughput of their networks, and save themselves a lot of agony."

Jim Slaymon, operations manager at PT Components, an industrial products manufacturer in Indianapolis, says his shop falls beyond the feasibility line. The manufacturer's data center houses an IBM 3081, an IBM 4331, and 30 IBM 3380 disk drives. "If we pay the assessment fee and do not meet IBM's requirements, we lose that money," he says. "Plus, even though IBM does not specify any one product, or even that it has to be IBM, we would eventually wind up needing other pieces of software to qualify. For the 6 percent we figured we'd save through CSA for one year, it is not a wise investment." IBM's requirement that users operate an information center or help desk manned by technical support staffers also bothers Slaymon. "The minimum salary for that type of expertise is $30,000," he notes.

Cautious optimism. IBM reps are just now beginning to sell CSA. "I am cautiously optimistic about the plan," says Richard Jesky, director of computer operations at Blue Cross/Blue Shield of Michigan (Detroit). Jesky believes his shop—which includes four types of IBM mainframes, including a 3090—will qualify immediately, and adds that it will probably opt for a three-year deal. "IBM is asking users to practice fundamental disciplines to manage their own systems," he says. "We practice these disciplines, which enables us to give IBM better information faster. In turn, IBM gets the service job done faster." Slaymon agrees that developing good maintenance habits in a data center reduces costs in the long run. "But you can discipline your shop using a third-party maintenance company as well," he asserts. ☐



Susan Banta

The rising revenues of the top five developers of artificial-intelligence systems reflect the move by those developers into mainstream corporate applications. For more on the leading lights in AI, see "Out of the ivory tower," page 47.

STRATEGIC SYSTEMS

MAKE A THIRD-PARTY DEAL

Independent maintenance vendors may be cheaper and faster—plus service mixed systems.

by David Whieldon, Large Systems Editor

Until recently, most MIS managers turned to hardware vendors to maintain major systems. That was natural—in the early days of "electronic accounting," maintenance was simply a part of the monthly leasing bill. And, only four or five years ago, no hardware vendor would have deigned to touch another manufacturer's gear.

All that's changed, however. In fact, so many alterations have taken place in the third-party maintenance business that it's recognizable only to industry insiders and market researchers. Divisions have been cut loose to become new entities. Datapoint Corp.'s service arm became Intelogic Trace Inc., for instance. There have been mergers, such as the one between General Electric's Integrated Communication Services Operation and the RCA Service Co., forming an as yet unnamed organization. The AT&T divestiture allowed big fish like Bell Atlantic Corp. to swallow smaller fish like Sorbus.

What's more, some leading hardware vendors—including Honeywell Inc. (Minneapolis), Control Data Corp. (Minneapolis), and Unisys Corp. (Detroit)—have discovered that they can maintain hardware that's not their own and make money at it. That's partly because they can expand their existing maintenance businesses, spreading overhead over more clients and thus increase profitability. "Many of the computer manufacturers' service operations subsidize other branches of their corporations," claims Alan Andrus, president of Grumman Systems Support Corp. "They're priced high to cover corporate overhead."

CONTRACT SERVICE

Dataserv Computer Maintenance	(612) 829-6000	**Circle 459**
Honeywell Third Party Svcs.	(617) 431-3177	**Circle 460**
McDonnell Douglas Field Svc.	(714) 250-1000	**Circle 461**
Nat'l. Advanced Syst.	(415) 962-6000	**Circle 462**
Storage Tech.	(303) 673-6761	**Circle 463**
Systec	(305) 323-0230	**Circle 464**
Unisys	(215) 542-3755	**Circle 465**

Despite recent growth and higher visibility, third-party service outfits have made only a dent in the overall service-maintenance market. "In 1986, the third parties' revenues amounted to $1.3 billion, with growth of 15 percent to 20 percent a year, mostly from acquisitions," says D.R. MacNaughton, president of Business Development International, a Franklin Lakes, NJ, consultancy. But he projects that maintenance revenues for IBM alone in 1986 will be $4.1 billion, and for the entire computer industry, $8 billion. The third parties will grab only a 7 percent to 16 percent share of the market.

HOW FAST IS FAST ENOUGH?

Average response and repair time needed (in hours)

User	Mainframes	Minis	Micros/ workstations
Hospitals	3.7	8.9	7.8
Banking	4.7	8.6	9.7
Manufacturing	5.4	8.7	9.0
Transportation/ distribution	8.3	8.3	11.3
Retailers	8.1	9.3	10.1
Insurance	7.2	8.0	8.6
Education	10.4	13.9	14.3
Government	8.0	6.5	11.5
Overall	6.0	8.7	9.7

Source: D.F. Blumberg & Assoc. Inc.

At the head of the pack of third-party maintainers are TRW's Customer Service division and Bell Atlantic's Sorbus, each with estimated 1986 revenues of $190 million, according to a study by MacNaughton. Not far behind are Intelogic Trace, the newly merged GE/RCA service organization, and Control Data's Engineering Services, each with more than $100 million in revenues. Other important players include Momentum Service Corp. (Parsippany, NJ), Dataserv Computer Maintenance Inc., now being acquired by Bell South Corp. (Atlanta), Grumman Systems Support, and Eaton Corp.'s Data Systems Services division.

Managers don't have to know who's who to benefit from third-party offerings. What's more important is to understand the possibilities for saving money and streamlining operations.

"There's a payoff if maintenance is managed," says Daniel Cavanagh, vice president of MIS at Metropolitan Life Insurance Co., New York. While Met Life's top management is concerned with how maintenance costs affect the bottom line, Cavanagh is given full responsibility to pare expenses as he sees fit. "Five or 10 years ago, you automatically got maintenance from a vendor," he says. "Now you have to take a hard look at maintenance costs and manage them." Met Life, which has a contract with the Customer Services division of Honeywell Information Systems for service on its Honeywell DPS-6 minicomputers, Codex modems, and AB Communications switches in sales offices, saves about 10 percent on its maintenance bill by going third party, Cavanagh estimates.

Cavanagh cautions that it's difficult to come up with exact percentages or dollar figures, since savings vary with negotiations and contracts. Maintenance vendors and observers also disagree on how much can be saved, but the claims and estimates range from 10 percent to 30 percent under what IBM, Unisys, Digital Equipment Corp., and other major manufacturers bill for service on their own products.

Glenn Dawson, principal consultant at the Service Research Group, Palmyra, NJ, agrees that it's difficult to pin down costs. To determine maintenance costs, he says, users must inventory hardware and add up line-item maintenance charges for all components. Those charges can then be compared to proposals from third-party maintainers product by product or on an installation of mixed products. Still, says Dawson, the difference on specific items may amount to 10 percent to 15 percent less than cost of IBM maintenance.

Because so many computers and peripherals are commodities today, major vendors can't lock customers into maintenance agreements, says Michael Mahoney, director of sales at the Customer Services division of Honeywell Information Systems. "There's no longer a captive audience," he says. In some shops, vendors may have manufactured only the processors—and may be in no better position to do maintenance than a third party. Offering service on Honeywell and other manufacturers' products, Honeywell Information Systems sees competition for such work heating up, Mahoney says. "On a major bid we've had as many as 32 competitors after the first cut."

At the same time, maintenance vendors find it necessary to deal with more and more products in customers' shops. Mahoney points out that Honeywell now services 2,000 products not manufactured by the vendor. Likewise, Roger Grant, vice president of marketing and sales at Intelogic Trace, notes that the corporation maintains 3,000 different products, from IBM System/34 and /36 minis down through a variety of personal computers and peripherals, even though Datapoint equipment maintenance furnishes a substantial portion of its revenues. And John Harnett, director of industry services at TRW's Customer Service division, says third parties look for high-volume products like the S/36 to service. He adds that most third parties are willing to bid on proposals for varied systems, including entire communications networks.

"There's a payoff if maintenance is managed."
Cavanagh, Metropolitan Life

The advantage of dealing with one maintenance vendor in a mixed-vendor setting is obvious: It prevents finger-pointing by vendor field engineers. But there's more to it than that, says Daniel Cavanagh. "It eliminates the problem of calling the wrong vendor, for example, if a problem exists in a modem rather than a minicomputer," he says. In short, if one corporation is responsible for all maintenance, then its representatives can't duck the responsibility for any single item.

Third-party vendors can serve MIS managers in yet another way, according to Alan Andrus at Grumman Systems Support. "Service aside, a third-party service provider can be used as a negotiating lever with a manufacturer unwilling to provide certain services, such as dedicating engineers to a customer site, greater availability of spare parts, or more say in field engineers assigned," he says.

Third parties can also extend the life of systems. "IBM makes boxes, and often its answer to a problem is to recommend bigger and more sophisticated boxes and additional peripherals," says Grant. "We may be able to supply new logic boards or additional memory to give the system more functionality, even if the manufacturer won't support the system."

Poor service from a major vendor is a strong motive for switching to third-party maintenance. When a large midwestern bank switched from IBM hardware to take advantage of software running only on DEC's VAX 8600 and 11/785, the data center manager turned to a third party because he was dissatisfied with DEC's service. "We'd been spoiled by IBM service," says the manager. "It was difficult to get hold of the DEC service representative. We couldn't get the two-hour service we wanted, and sometimes had to wait three days for parts from the East Coast. Unlike IBM, DEC didn't help in connecting third-party products, such as disk drives."

The bank considered and accepted a

THIRD-PARTY MAINTENANCE PROVIDERS

Independent service vendors

Vendor	Service wait	Hourly rates
Bell Atlanticom (609) 987-7000	3 to 24 hrs.	$60 **Circle 444**
Control Data (612) 851-4000	2 to 4 hrs.	$113 to $188 **Circle 445**
Eaton (213) 215-0853	4 hrs.	$75 to $85 **Circle 446**
General Electric Computer Svcs. (404) 843-6200	Negotiable	$85 to $95 **Circle 447**
Grumman Syst. Support (516) 682-5306	4 hrs.	$75 to $105 **Circle 448**
Harris (305) 974-1700	4 hrs.	$120 to $140 **Circle 449**
Intelogic Trace (512) 699-5700	Negotiable	$55 to $90 **Circle 450**
NCR (513) 439-8600	Within 4 hrs.	$88 to $175 **Circle 451**
Sorbus (215) 296-6000	2 hrs.	$61 to $173 **Circle 452**
Total Tech. Svcs. (216) 237-8363	2 hrs.	$50 (micro products); $171 to $202 (mainframe products) **Circle 453**
TRW (201) 575-7110	2 to 4 hrs.	$100 to $150 **Circle 454**
Western Union (201) 825-5000	4 hrs.	$85 (contract); $105 (non-contract) **Circle 455**

Rates and response times are frequently negotiable through contracts; most prices given are for noncontract work.

Conditional maintenance providers

Vendor	Service provided/wait	Rates
DEC (617) 870-2061	Services DEC and non-DEC equipment for DEC customers/negotiable	Contract-dependent **Circle 456**
IBM (201) 848-1900	Services IBM PCs and related products/negotiable	Product-dependent **Circle 457**
Xerox/Americare (716) 427-5400	Micro service/24 hrs.	$125 to $145/hr. **Circle 458**

> "Even if service hasn't been bad, a third-party service provider can be used as a negotiating lever with a manufacturer unwilling to provide certain services."
>
> *Andrus, Grumman*

proposal from Grumman Systems Support. "We had nothing to lose," he says. "It's been very successful. We have a representative on-site full-time and access to spare parts stored locally. The cost is 15 percent less than the DEC contract."

Simply cutting back on service is a familiar way to save maintenance dollars. The data center manager at the midwestern bank says, "To be more cost-effective, we put some equipment that doesn't break down often on a per-call basis and saved a couple of hundred thousand dollars in 1985." However, he warns that users shouldn't push so far as to risk corporate data assets. Grant adds that "there's a trend to cutting coverage on less critical equipment."

For some users, self-maintenance has become an attractive alternative that may cut costs by as much as 40 percent. It's especially suitable for personal computers, boards, and peripherals. Dan Cavanagh describes Met Life's two-building "campus" in New York, where 1,500 IBM Personal Computers or compatibles are located. A team of four employees, trained by the corporation, swaps out parts from a parts inventory and sends out selected parts for repair. Users most likely to perform their own maintenance are manufacturers, engineering and scientific corporations, and banks, says Harnett of TRW.

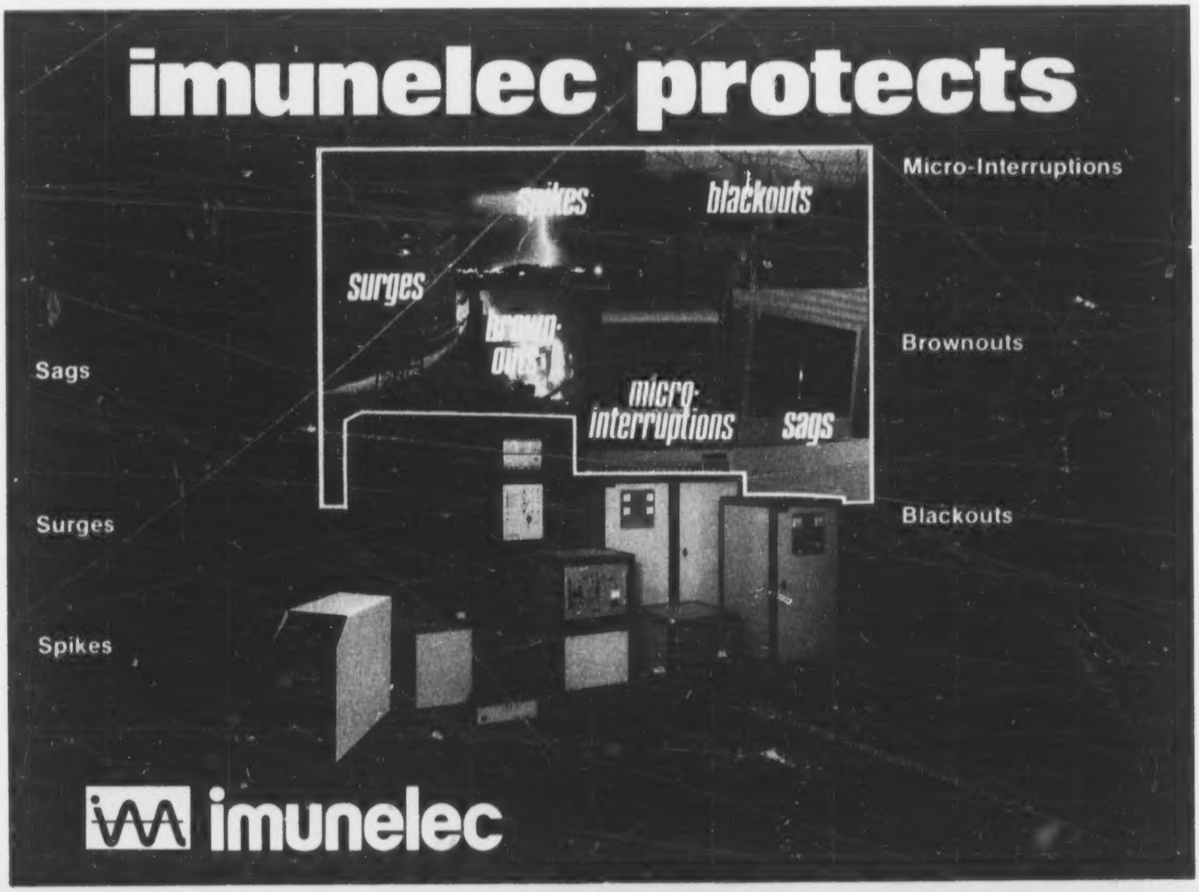
Some vendors provide service for smaller items right on the customer's premises. "Many corporations, like DEC and Hewlett-Packard, offer depot service for micros and terminals," says Gary Khederian, senior research analyst at International Data Corp., Framingham, MA.

At Sunkist Growers Inc., Sherman Oaks, CA, dp manager Jack Abbott and two other managers discussed maintenance for an IBM mainframe and peripherals with Sorbus, and as part of that effort checked references and made contacts with users. They then held a meeting with IBM representatives to see if they could counter the Sorbus offer.

"We had to look at the dollars," says Abbott, "and Sorbus offered us a savings of 21 percent over IBM." Abbott and his colleagues also made sure that a 30-day clause was part of the contract: Sunkist can get out of the contract on 30 days' notice if it isn't satisfied with service and the equipment will be brought up to IBM standards to be serviceable by IBM again.

Abbott believed that he didn't need all the support that IBM offers its customers. IBM offered Sunkist two skilled systems programmers, one experienced with OS/VS1 and the other with VM, and a telecommunications manager to service its network of 5,000 to 6,000 citrus growers in California and Arizona and about 150 online terminal users and batch operations in headquarters. IBM service is still available to Sunkist on a time-and-materials basis.

Most experts agree that the growth of third-party maintenance, the increased competition among manufacturers and third parties, and users' growing awareness of alternatives can only benefit those users. Shrewd managers, if they weigh the choices, can exploit the opportunity to their advantage—and to the advantage of their managements. ☐



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FEBRUARY 9, 1987

- DBMS put to the test
- ISDN's missing link
- Why Sandoz loves Unix
- IBM's 400 club
- HP Spectrum up close
- Peaking hard disk power

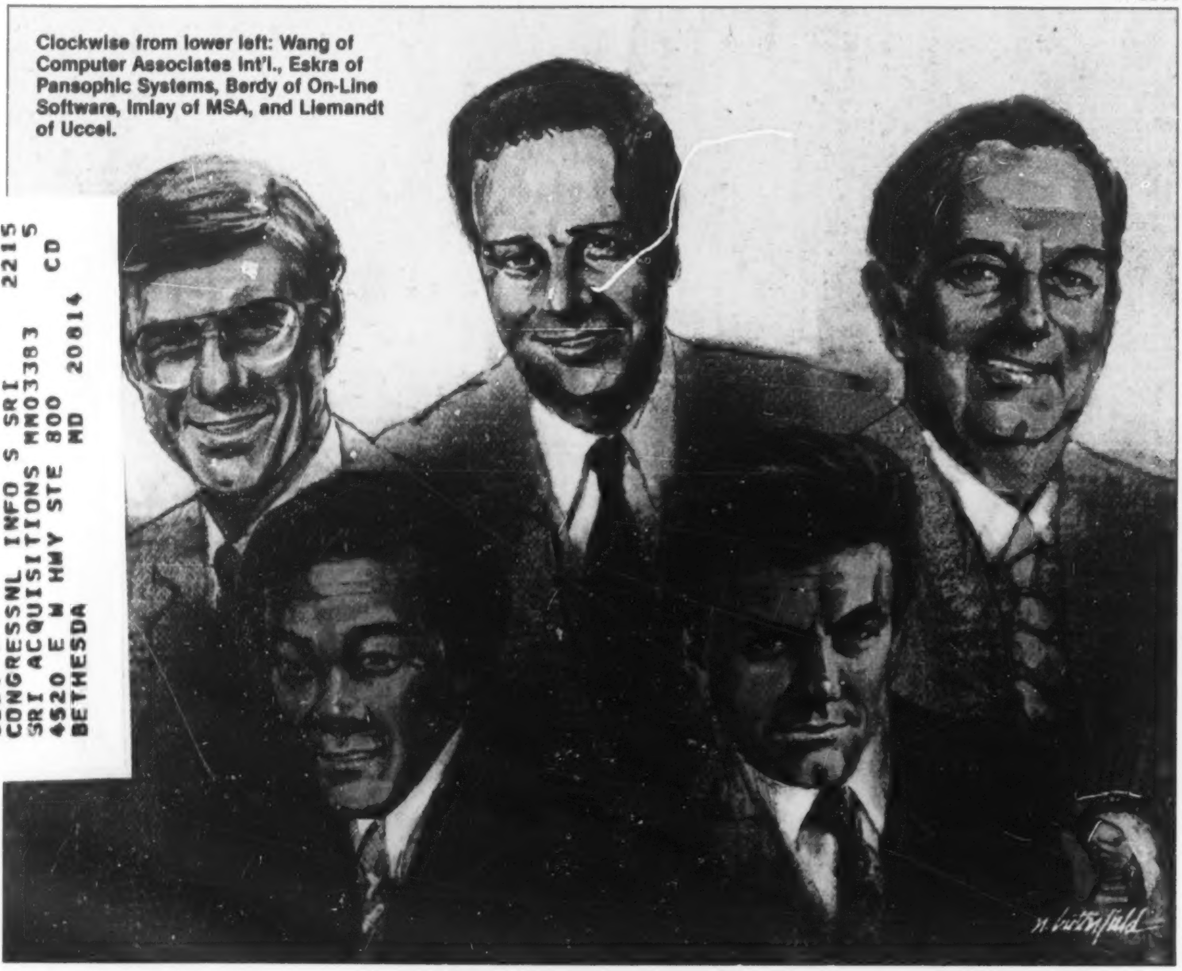
COMPUTER DECISIONS

THE MAGAZINE FOR MIS EXECUTIVES
A HAYDEN PUBLICATION

SOFT WARS

Aggressive new leaders are spearheading a trend toward consolidation in the large-systems software industry. Will users benefit?

PAGE 28



Clockwise from lower left: Wang of Computer Associates Int'l., Eskra of Pansophic Systems, Berdy of On-Line Software, Imlay of MSA, and Liemandt of Uccel.

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SOFT WARS
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43 Finding challenges instead of barriers/For Ron Bailey of Domino's Pizza, "Do it!" is more than a work ethic—it's a way of life.

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Computer Decisions (USPS 771-040 ISSN 0010-4558) is published biweekly for $65 per year by Hayden Publishing Co., Inc., a subsidiary of VNU, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address change to *Computer Decisions*, PO Box 1031, Southeastern, PA 19398. For subscription information, please call (215) 337-8623.

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Cover illustration: Ned Butterfield

Copies printed: 181,755

Micro suits now in style

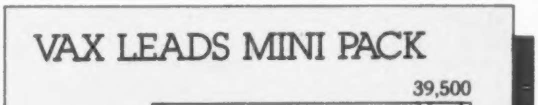
In mainframes, it's IBM vs. Hitachi and Fujitsu. In minis, it's DEC vs. Emulex. Now the two leaders in micro software—Lotus Development Corp. and Ashton-Tate—are going to court in separate actions to ward off competitors by charging that their technology was ripped off.

In the action with more far-reaching consequences, Cambridge, MA-based Lotus is charging that Paperback Software's VP Planner and Mosaic's Twin (both about $100) illegally copy the "look and feel" and user interface of Lotus 1-2-3 ($495). Last year, in a suit brought by Broderbund Software (San Rafael, CA), a judge ruled that Broderbund's user interface was copyrightable.

Lotus claims it is trying to protect its intellectual property, but critics counter that the suit will impede competition and deter other developers from improving on Lotus' design in other packages. Paperback Software (Berkeley, CA) and Mosaic (Cambridge, MA) refute Lotus' claims. Ironically, Pergamon Journals Inc. (Elmsford, NY) recently filed a lawsuit charging that Lotus' new Manuscript package infringed on Pergamon's Manuscript Manager software trademark.

Ashton-Tate (Torrance, CA) is suing Migent Inc. (Incline Village, NV), for allegedly stealing trade secrets. Migent recently hired some of Ashton-Tate's best talent; specifically named as defendants are Wayne Ratliff, the developer of dBase II, and Gary Lang, formerly Ashton-Tate's SQL specialist. Ashton-Tate claims Migent is using proprietary Ashton-Tate information in a new 32-bit database management system under development. Migent denies the allegations.

As for Digital Equipment Corp., a Massachusetts federal judge recently granted a temporary injunction against Emulex Corp. (Costa Mesa, CA) that prevents Emulex from selling any of the peripheral technology that is the subject of the ongoing litigation between the two vendors. In papers mentioning secret meetings in Emulex's parking lot, DEC claims Emulex illegally obtained proprietary DEC peripheral interface information. ☐



Source: Computer Intelligence

Comparing minicomputers rated at about .25 MIPS to 12 MIPS, Computer Intelligence estimated the top mini computers. IBM's System/36, with an installed base of 51,735, primarily is rated at under .25 MIPS.

New channel cuts I/O time

National Advanced Systems Inc. announced the Model 7990-2X Semiconductor Disk Subsystem, the first IBM plug-compatible peripheral to offer a channel speed of 6 Mbytes per second. NAS claims the new channel cuts input/output response time by 48 percent.

NAS is offering the new channel as a standard feature for the AS/XL mainframe series. Any storage subsystem with caches or buffers are excellent candidates for the 6-Mbyte feature, claims NAS. The Mountain View, CA, vendor says the channel will be available at no additional charge in future offerings, and that field upgrades are also free.

Currently, the Model 7990-2X—slated for April delivery—is the only plug-compatible peripheral offering 6-Mbyte-per-second performance. However, it's likely to have company soon. According to Phoenix-based Annex Research, Hitachi Ltd.'s MT-400 3480-type tape cartridge—which already operates at 6 Mbytes per second—is likely to appear on the U.S. market. ☐

Untimely dp power outage

Five weeks before its move into a new data center with its own diesel-powered uninterruptible power supply, Putnam Investor Services lost all power at its Shareholder Services division when a generator exploded at the corporation's offices in Boston.

Putnam used computer rooms of the Sungard Recovery Services backup center in Philadelphia for six days. To handle incoming phone calls from investors, Putnam borrowed several extra 800 lines from WGBH, the local public TV station, which was between funding drives at the time.

Eight computer operators, lugging boxes of backup tapes stored in a vault at a nearby bank, flew down to Philadelphia the day after the blackout on December 10. Even after Putnam obtained a mobile power van for the stricken data center, it still relied on Sungard computers to support 312 terminals. The Shareholder Services division now occupies the new data center in Quincy, MA. ☐

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N TO MACBUSINESS

MARCH 9, 1987

- Capacity management: No longer a black art
- The future of micros
- How to fight F.U.D.

COMPUTER Decisions

THE MAGAZINE FOR MIS EXECUTIVES
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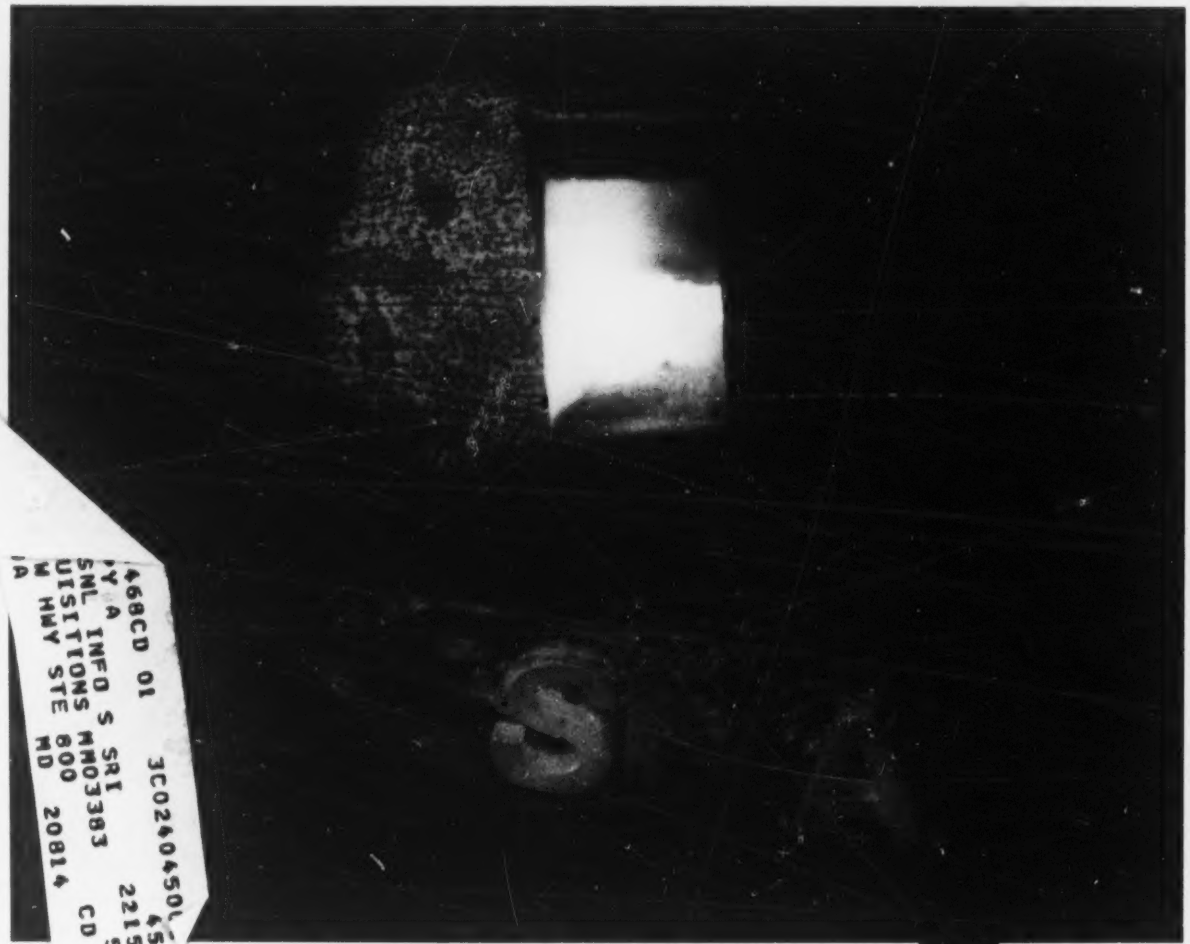
SPECIAL REPORT

REFORGING SNA

IBM's implementation of a "distributed" SNA is incomplete. New offerings, however, foreshadow the shape of the new SNA.

PAGE 30



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32 Questions remain open on SNA in midrange/Although IBM has cleared some of the air regarding the place of its midrange computers in SNA, questions remain.

34 Choosing muxes for specific reasons/T-1 is frequently—but not always—the answer. MIS managers gear multiplexer choices to their organizations' specific needs.

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Computer Decisions (USPS 771-040 ISSN 0010-4558) is published biweekly for $65 per year by Hayden Publishing Co., Inc., a subsidiary of VNU, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address change to *Computer Decisions*, P.O. Box 1031, Southeastern, PA 19398. For subscription information, please call (215) 337-8623.

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58 MIS hedges on the AI gamble/In many corporations, MIS is passing on getting involved in the development of artificial-intelligence systems. Some believe that may not be a wise move.

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Cover photo: Bob Ward

easy to use. The fourth-rated package, the Primavera Project Planner ($4,000) from Primavera Systems Inc., Bala Cynwyd, PA, was rated more powerful than the top three, but harder to use.

Power and ease of use aside, Software Digest (Philadelphia) cautions that Microsoft Project lacks the important resource leveling function, the process of manipulating a schedule to reduce conflicts in the use of resources for a project. Time Line and SSP's Promise have less capability in resource planning than the Primavera Project Planner, Plantrac ($3,000, from Computerline Inc., Pembroke, MA), and Open Plan ($4,200, Welcom Software Technology Inc. Houston).

The results are reported in the February 1987 *Software Digest Ratings Report.* Call (215) 878-9300 for more information. □

Have PBX, need ISDN

AT&T is touting recent software enhancements to its System 85 private branch exchange that make the PBX among the first to support the vendor's primary rate interface (23B & D channels) specifications for ISDN. But any user enthusiasm should be tempered by the fact that, in the United States anyway, there is no standard ISDN with which to connect.

Greg Carlsted, senior industry analyst for Dataquest, a San Jose, CA-based consultancy, says that System 85 reaffirms AT&T's commitment to Integrated Services Digital Network, but beyond that he sees "extremely limited" applications for the computer's primary rate interface. Carlsted adds that the enhanced System 85 supports a byte-oriented signaling protocol that runs counter to the bit-oriented DMI interface, the currently favored ISDN signaling protocol.

Siemens Communications Systems Inc. (Boca Raton, FL) also offers ISDN-compatible equipment; the West German-based vendor's Hi Comm PBX, which also supports the ISDN primary rate interface, is already installed and running in Europe. However, Susan Gauff, a Siemens spokeswoman, notes that Europe already has an approved primary rate ISDN interface standard. That standard has been endorsed by the Geneva-based Consultative Committee on International Telephone and Telegraph. "Siemens believes it is premature to announce an ISDN-compatible product in the United States because there are no set standards," says Gauff. □

IBM and DEC chip away

IBM and DEC have demonstrated how to use financial muscle to compete in markets—specifically, the engineering workstation arena—in which bolder but smaller competitors lead.

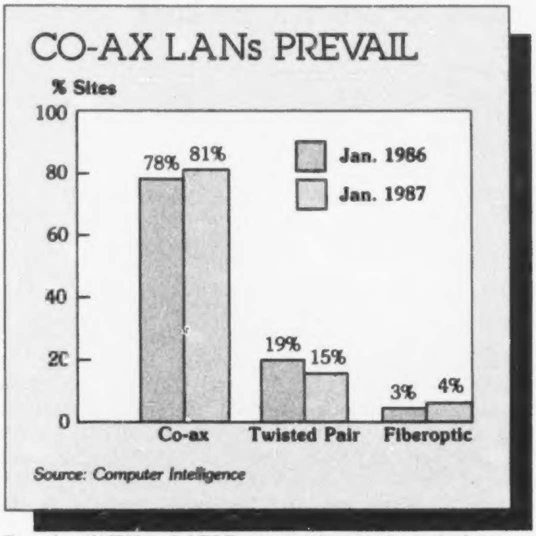
Using advanced silicon technology, the computer giants were able to shrink systems electronics in their 32-bit workstations from four boards to one. As a result, IBM was able to triple the speed of its RT Personal Computer, while Digital Equipment Corp. dropped the price of its MicroVAX workstations by 50 percent.

One year after introducing the RT PC, IBM announced three new RT PCs with IBM's new 1-Mbyte memory chips. The new models offer four times the memory (16 Mbytes) of the original, an advanced CMOS processor that can triple processing speed, and a built-in 20-MHz floating-point accelerator that increases number-crunching capability by eight times. The new models offer the same maximum 210 M-bytes of hard-disk storage as the original, but they contain a new adapter that quadruples the speed data move between memory and disk. Another new adapter allows high-resolution displays (1,024 pixels by 1,024 pixels) to be connected directly to the RT PC instead of having to go through IBM's 5085 Graphics Display System.

RT PC Models 115, 125, and B25 cost from $10,600 to $17,670, down from the original $11,700 to $19,510 range.

IBM is also offering discounts of more than 25 percent to users who buy the new models in quantities of 20 or more. The new machines are scheduled for release in May.

Although rated at the same .9 million instructions per second as the original MicroVAX II, DEC's new MicroVAX 2000 and VAXstation 2000 contain downsized electronics that allow the vendor to sell the machines for about half the price of the old models. The VAXstation 2000 technical workstation package includes a floating-point accelerator, a high-resolution monitor, and an Ethernet adapter, and costs from $10,500 to $22,245. The MicroVAX 2000 for commercial applications costs from $11,100 to $20,195. The machines will ship in 90 days, DEC says. □



Source: Computer Intelligence

Even though IBM and AT&T are now shipping the twisted-pair media for their Token-Ring and Starlan local-area networks, a survey by Computer Intelligence, La Jolla, CA-based market researchers. found that the number of LANs installed with co-axial wiring actually increased in 1986.

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3/19/87

MARCH 23, 1987

- Sizing up the new micro superchargers
- Blunting Cobra's bite
- Dark data centers
- Desk-top publishing's integration challenge

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A GRAND NET PLAN

New York's Chemical Bank pioneers a far-reaching network designed to link 260 branch office LANs with mainframes via IBM's LU 6.2.

PAGE 45

Rosemary Baer, vice president/department head for online systems planning and development, is the architect of Chemical's new network scheme.

COMPUTER DECISIONS A GRAND NET PLAN/MICRO SUPERCHARGERS

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Cover photo: Ted Hardin

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Computer Decisions (USPS 771-040 ISSN 0010-4558) is published biweekly for $65 per year by Hayden Publishing Co., Inc., 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address change to *Computer Decisions*, P.O. Box 1031, Southeastern, PA 19398. For subscription information, please call (215)630-9323.

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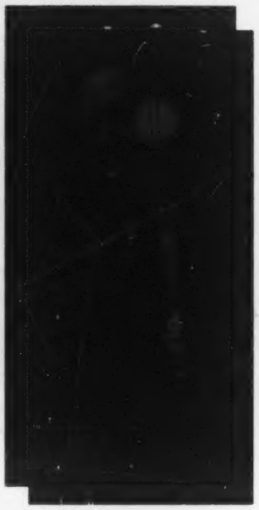

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ble with Unix System V Version 3 are available to developers. AT&T and Interactive Systems (Santa Monica, CA) plan to sell a 386 Unix without the Xenix ties. Upstart Microport Systems (Scotts Valley, CA) claims that next month it will ship a System V Version 3 Unix for the 386 that will eventually support both MS-DOS and Xenix applications. The Microport Runtime System V/386, with an introductory price of $299, is waiting for AT&T certification. ☐

A richer IBM-DEC emulator

Interlink Computer Sciences, a Fremont, CA-based communications vendor, claims it now offers terminal emulation software providing the richest DEC VT100-to-IBM 3278 emulation available.

The new software runs on MVS mainframes and requires Interlink's 3711 gateway. IBM 3278 emulation costs $5,950 and VT100 emulation $10,980; the gateway is priced at $40,000 to $80,000. The software enhancement gives VT100 terminals full-screen 3278 Model 2 emulation and gives IBM 3278 terminals full-screen VT100 emulation. Previously, only line-mode emulation was available from Interlink and most DEC-IBM link vendors. Interlink claims that the full-screen emulation can work with virtually any DEC or IBM software package. The vendor also says the package lets users reconfigure 27 different function keys, a key feature when trying to make keyboards from the two different vendors act the same. ☐

In-house net management

More corporations are deciding to handle their own network support and service instead of enlisting the aid of vendors, reports the Ledgeway Group, a Lexington, MA-based market researcher.

Slightly more than half of the 1,000 corporations surveyed by Ledgeway last year reported they were using in-house staff for network management and support tasks. In a 1985 survey, roughly 70 percent said they were relying on vendors for these tasks.

The trend toward in-house support shows that network technology is maturing, the market researcher concludes. As internal staffs mature, network technology stabilizes, and as networks become more important for conducting corporate business, customers are becoming more self-reliant, says Richard C. Munn, Ledgeway's managing director. Ledgeway also reports that most network purchases are now targeted at network expansion rather than new networks. ☐

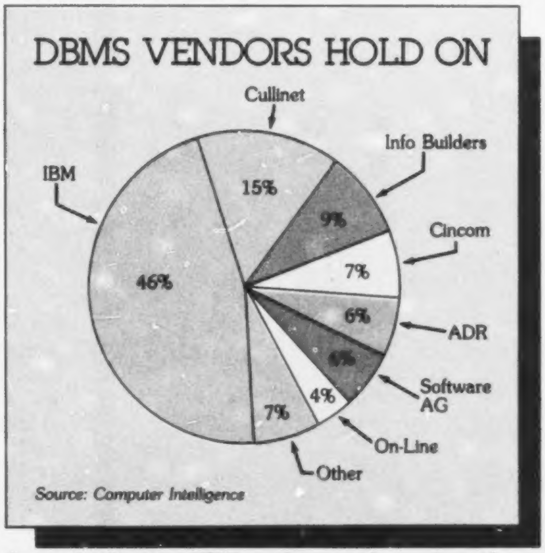
Keep those VAXs comin'

In the latest of its VAX-a-month announcements, Digital Equipment Corp. has shifted the balance of power in the VAXBI-bus-based 8000 series by replacing three low-end models.

With the introduction of the VAX 8250, DEC has lowered the entry price into the VAX 8000 series from $88,000 to $65,000. The price/performance ratio of the new model is about 40 percent better than its predecessor, the VAX 8200. For $88,000, users can now purchase a VAX 8350, which offers twice the performance of the VAX 8200. According to the vendor, new VAX ZMOS chip technology is responsible for the performance increases.

At $291,000, the VAX 8530 is about 25 times more powerful and only 2 percent more expensive than the VAX 8500. The VAX 8500 can be upgraded to the VAX 8530 by adding enhanced microcode. According to William Demmer, vice president of DEC's midrange systems business group, DEC will give the microcode to VAX 8500 users without charge.

DEC also announced it has cut prices for memory on all VAX models by about 50 percent, and has adjusted prices on all VAX systems. The new prices were not available at press time. ☐



Source: Computer Intelligence

Despite the shipment of IBM's much improved new release of DB2, the latest numbers from Computer Intelligence show IBM and its competitors retaining about the same percentages of market share in 1986 that they held in 1985.

IBM mini forecast

Expect a 9-MIPS IBM minicomputer early next year in the form of either a "4391" or a high-performance model in IBM's new 937X series, says Bill Husband, a senior consultant to The Meridian Group, a Deerfield, IL-based computer lessor.

The new machine will be part of a series of computers rated at between 3 MIPS and 15 MIPS and will replace the 4381 and the low-end "Sierra" models 3090/150 and 3090/180, Husband predicts.

Furthermore, he says users can expect to see a prepackaged, easy-to-use MVS/XA operating system to entice DOS/VSE diehards to upgrade to MVS/XA, the more functional but higher-priced operating system for the 3090s. ☐

(Continued from page 29)

standardization of varied proprietary lower-level vendor communications protocols, an effort that is proceeding slowly at different standards bodies, such as the International Standards Organization and the Institute of Electrical and Electronics Engineering. "X Window is just one layer of the communications puzzle that assumes that problems will get straightened out at the lower layers," explains Lerman. Currently, X Window runs on networks with the Unix-oriented TCP/IP transport protocol. To be able to view and access applications on incompatible machines in the network via X Window, users must have already solved signficant networking differences between hardware and software vendors. With ISO's Open Systems Interconnect and other standard protocols gaining acceptance from major workstation vendors, X Window—as a network-independent presentation-layer protocol—may eventually ride atop such standards to connect heterogenous systems.

X Window supporters want to concentrate on the positive, especially at DEC. The vendor's effort to standardize X Window through its new DECwindows program is being labeled by DEC as its most important software architecture development in many years. "Before, there was little similarity between Ultrix and VMS," says Roger Heinen, corporate consulting engineer at DEC. "Now, applications can be written that handle graphics the same way on VMS and Ultrix. It [X Window] will allow us to build hardware that maps against only one software architecture."

X Window support for all DEC workstations will present users with a common user interface and software developers with a common application interface. Potentially, users will be able to choose any combination of workstations, from micros to 32-bit systems, all running different operating systems but sharing the same interface. For example, a user on an Ultrix, VMS, or MS-DOS workstation could transparently run an application on a remote VAX VMS system. DEC will use one of the X Window tool kits to assemble a "DEC style" interface, and "publish what it looks like so third parties can build applications with similar looks," according to a DEC spokesperson.

Through DECwindows, applications for Microsoft Windows from Microsoft Corp. (Redmond, WA) and X Window can run on the same micro, according to DEC. The vendor intends to layer the X protocol on top of Microsoft Windows. Users on DEC VAXmate personal computers could run Microsoft's Excel in one window using Microsoft Windows. In another window, they could access and display a remote VAX application, and use the X protocol to transfer information to Microsoft.

More IBM ammo. DEC's strategy to standardize on the X protocol will give DEC additional firepower against rival IBM, observers feel. "[DEC CEO] Ken Olsen has always sounded off about the virtues of one VAX architecture running one operating system [VMS]. But it's no longer one operating system," says Vicki Brown, program manager of CAD/CAE/CAM at International Data Corp., a Framingham, MA, market researcher. "X Window will provide DEC with the glue to have the same user interface across all systems."

Although not all vendors have gone this far with X Window, its support by DEC, Hewlett-Packard, Apollo, Data General Corp. (Westboro, MA), along with IBM's recent endorsement of X Window for its RTPC workstation and software vendors should provide more than enough muscle to drive X Window as a standard. ☐

Steve Feldman is a free-lance writer based in Boston.

CIO

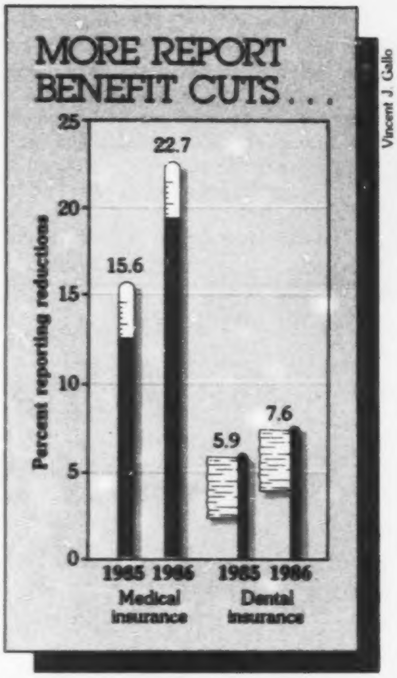
SMALLER RAISES, BENEFITS IN 1986

by David Roman, Associate Editor

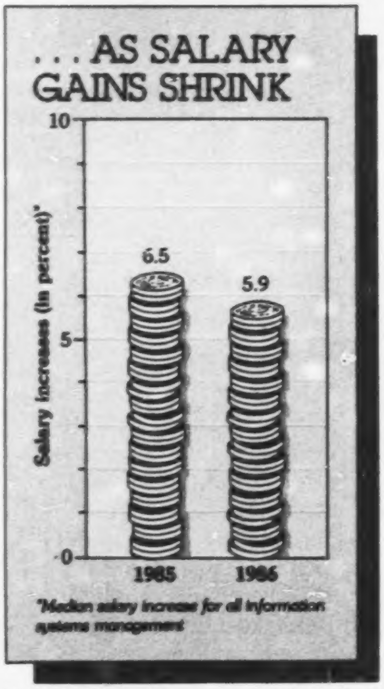
MIS/dp management salary increases were smaller in 1986 than in 1985, and many organizations also reduced key medical and dental insurance benefits programs, according to *Computer Decisions'* eighth annual Salary-Status Survey.

The average annual salary for MIS/dp management in 1986 was $44,360, up 5.9 percent from the 1985 average. But the increase was 10 percent smaller than last year's, according to the survey. In addition, the number of respondents reporting that their medical benefits coverage had been reduced nearly doubled in 1986. The number reporting dental benefit decreases jumped more than 20 percent.

Curbing health care costs. "Health care costs have gone up considerably, and most companies have taken steps to control them," says William Yacullo, executive vice president of Lauer, Sbarbaro & Associates, a Chicago-based executive search firm that has worked on compensation and benefits programs for client corporations.



Vincent J. Gallo



*Median salary increase for all information systems management

"There is also a trend to keep base salaries in line," Yacullo says. The 1987 Data Processing Salaries Report of the Administrative Management Society (AMS), a professional association based in Willow Grove, PA, also reports a lower average increase in MIS/dp management salaries for 1986 than for 1985. Management salaries increased 5.7 percent in 1985, but only 4.4 percent last year, AMS found. AMS reports that the average increase in salary for all data processing professionals decreased last year. Salaries increased only 3.5 percent on average, compared with 5.3 percent increases the year before, AMS says.

The *Computer Decisions* Salary-Status Survey found the median salary for those in charge of MIS for their organizations to be $58,235. The median for those managers in charge of dp at a departmental or division level at their organization was $51,111, notably higher than the $42,286 median reported by those responsible for dp for their entire organization. This likely reflects the higher salaries paid by large organizations, in which separate dp operations are often set up for distinct corporate entities. The median salary for those in charge of systems programming at their organizations was $49,375.

Who pays the most. The highest-paid MIS/dp managers, with titles ranging from micro managers to the top information systems executive, work in the financial, banking, and insurance industries. Those managers pull down a median salary of $53,750. Utilities were the next highest paying employers, at $48,888. Manufacturing and processing organizations followed with $47,647, and government agencies paid a median salary of $46,154.

Although women make up, on average, 36.1 percent of the MIS staff at a typical organization, they are more likely to be found working as librarians or machine operators than as programmers or systems analysts. The communications, database, and microcomputer specialist positions are dominated by males at most organizations, according to the *Computer Decisions* survey.

Turnover in management ranks is much lower than among staff, the survey notes. Managers reported an average 7.2 percent turnover rate of their staffs. They report a much lower rate for themselves. Only 3 percent changed positions last year, compared with 5.8 percent of respondents who changed jobs the year before.

A substantial majority of the top MIS/dp executives surveyed supervise programmers (82.9 percent) and analysts (76.5 percent). Only a slim majority oversee microcomputer specialists (57.1 percent) or database specialists (53.4 percent), and only 46 percent have communications specialists reporting to them.

Most of the higher-level managers had responsibility at their organizations for data communications (77.6 percent), for making applications available to end users (77 percent), and for database administration (73.6 percent). Fewer had primary responsibility for departmental microcomputers (70.5 percent), office automation (67.7 percent), and local-area networks (67.1 percent). A minority of repondents were responsible for voice and phone communications (32.9 percent), CAD/CAM/CAE applications (27.8 percent), and factory automation (13.4 percent).

Computer Decisions' Salary-Status Survey, conducted by Abbott, Langer & Associates, was mailed to 1,950 managers selected from the magazine's subscription list. Reported results are based on 365 returned questionnaires. Complete results of the survey are available from Abbott, Langer & Associates, 548 First St., Crete, IL 60417, (312) 672-4200. ☐

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- The LAN-to-mainframe connection
- DSS is dead; long live DSS
- T-1-to-AT&T link
- IBM's SNA paradox

COMPUTER DECISIONS

THE MAGAZINE FOR MIS EXECUTIVES
A HAYDEN PUBLICATION

SCANNING THE HIGH-TECH HORIZON

A select few tackle one of MIS' toughest jobs: applying technologies of the future to problems of the present.

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Ray Hoving (left), emerging technologies manager, and Peter Mather, vice president of MIS at Air Products and Chemicals, Allentown, PA, search for high-tech futures that work.

COMPUTER DECISIONS SCANNING THE HIGH-TECH HORIZON APRIL 6, 1987 VOL. 19 NO. 7

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Computer Decisions (USPS 771-040 ISSN 0010-4558) is published monthly except for two issues in January, February, and March for $65 per year by Hayden Publishing Co., Inc., a subsidiary of VNU, 10 Mulholland Dr., Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address changes to *Computer Decisions*, P.O. Box 1031, Southeastern, PA 19398. For subscription information, please call (215) 630-9323.

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Cover Photo: Brian Tolbert/BRT Photo

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resolution of 400 dpi. Misregistration of overlayed colors will not be a problem, he says. Colorocs' laser will feature much improved sensing control, with a microprocessor monitoring registration, heat, and other "environmentals," Rowe suggests. Colorocs claims Sharp and QMS as OEM customers of its laser engine. Observers say the vendor may announce a color copier prior to introducing its laser engine.

The IRD report on color laser printers is available for $1,850. ☐

T-1 call compression

Timeplex Inc. (Woodcliff Lake, NJ) now offers an add-on voice-compression module for its Link family of multiplexers that lets users send up to 10 times more voice conversations over a Timeplex T-1 link.

In addition to the greater voice compression, the Link Packetized Voice Server offers "near toll quality" voice digitization, the vendor says. The add-on module, which includes a proprietary speech-encoding algorithm, requires only 224 Kbps for every 40 voice channels, freeing a substantial amount of bandwidth for other voice and data applications, according to Timeplex.

The LPVS-40 ($145,000) accommodates up to 40 simultaneous conversations over four DS0 frames within a single T-1 link (there are 24 DS0 frames in a T-1 link). The LPVS-8 ($33,000) handles up to eight simultaneous conversations on a single DS0 frame. The modules are slated for the third quarter of this year. ☐

Missing standards

Although MIS departments in large corporations want a hand in setting network standards, a recent survey indicates that big users are playing only a minimal role in standards making.

In the survey, conducted by Forrester Research Inc. (Cambridge, MA), only 13 percent of MIS managers in Fortune 1,000 corporations said they were involved in the Open Systems Interconnect (OSI) standards process. Nine percent said they were involved with Manufacturing Automation Protocol (MAP), 9 percent with Integrated Services Digital Network (ISDN), and only 4 percent with the Technical and Office Protocols (TOP).

"Without user input, standards making has become a political dogfight, with vendors pushing their own technologies without respect for what the market really wants," says George F. Colony, president of Forrester Research. Only the Corporation for Open Systems is making a major effort to get users involved in shaping network protocols, he says. Only 14 user corporations belong to COS. ☐

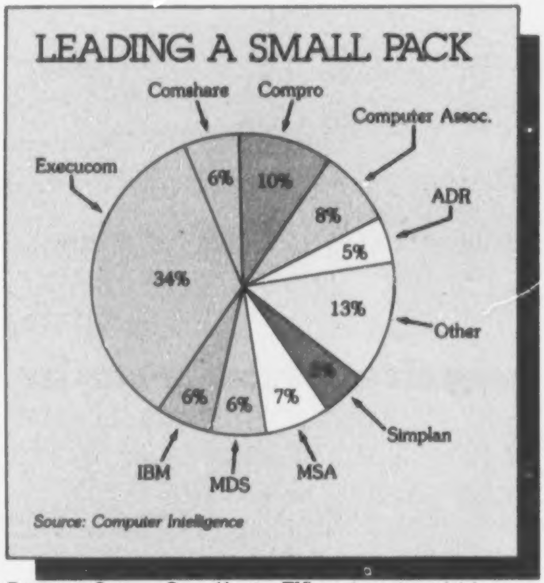
A matter of finances

Despite vendor ballyhoo, large corporations are not buying mainframe financial analysis software, according to Computer Intelligence, La Jolla, CA, market researchers.

Computer Intelligence reports that only 6 percent of the large corporations it surveyed recently have purchased such packages from software vendors. Buyers believe financial analysis software is too expensive and too complex, the market researcher adds.

Execucom Systems Corp. (Austin, TX), the leading supplier of mainframe financial analysis software, is hoping to attract more users by improving its offering, IFPS. Execucom is touting a new capability in Release 3.0 of IFPS that will let managers and analysts ask in simple terms why certain results occur in a financial model. "This provides the next set of questions beyond the 'what if' scenarios," says Carol Limperos, Execucom's vice president of product marketing. Limperos expects the new feature to help increase sales of IFPS from 10 percent to 20 percent this year.

With the new feature, for example, users can input a natural language query like, "Why did net income go down in quarter 3?" IFPS's new "explain" facility might respond, "Net income went down in quarter 3 because sales in region 4 decreased." To provide this feature, Execucom added Fortran code; the new release IFPS will require slightly more memory, but performance will not be impeded by the added code, the vendor says. The package, which runs on IBM mainframes under MVS/TSO or VM/CMS, Digital Equipment Corp. VAXs, and machines from Prime Computer Inc. (Natick, MA) and Unisys Corp. (Detroit), costs from $9,000 to $85,000 and is available now. ☐



Source: Computer Intelligence

Execucom Systems Corp. (Austin, TX) continues to maintain a hefty lead among IBM/PCM mainframe financial analysis software vendors. However, a Computer Intelligence survey of large IBM/PCM users shows that only 6 percent have installed vendor-supplied financial analysis software; 12 percent have in-house financial analysis packages, and 82 percent don't have them at all.

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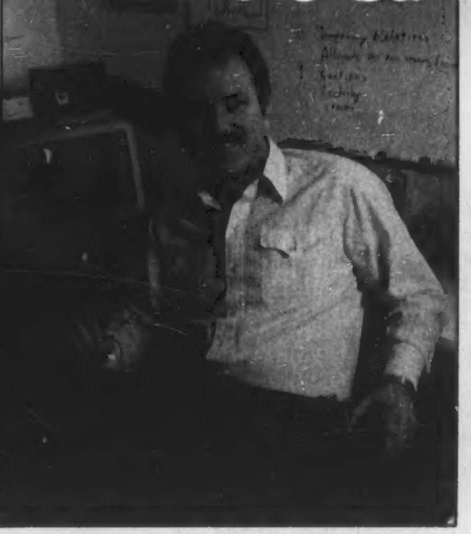

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Large Systems/

Joseph Braue

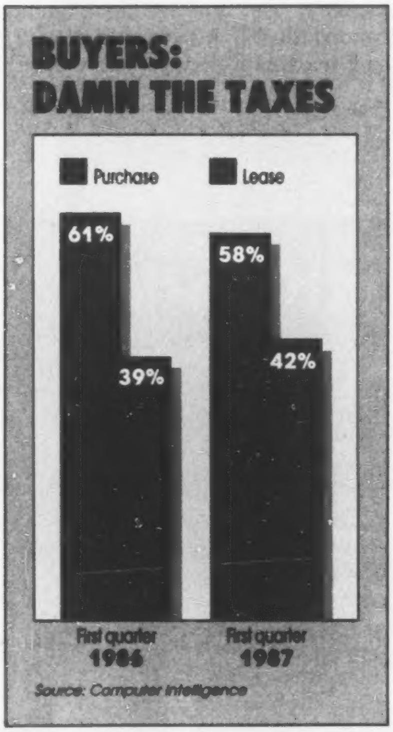
When in doubt, lease

Tax reform may be tipping the buy vs. lease scales toward leasing new large systems, according to one research outfit.

In one of the first looks at 1987 computer acquisitions to be released, Computer Intelligence, La Jolla, CA, found that 3 percent more corporations leased their IBM or plug-compatible 370 mainframe systems in the first quarter of 1987 than in the first quarter of 1986 (see chart). Some say this could be a sign of things to come.

Observers attribute the upswing in leasing to uncertainty among users—when in doubt, lease—and the new alternative minimum tax, which can penalize corporations for taking too many tax deductions on computers and other equipment they buy. To calculate the alternative minimum tax, corporations must add tax deductions, such as accelerated depreciation, to taxable income and multiply by 20 percent. If this number exceeds taxes calculated through standard procedures, corporations have to pay the larger amount.

To avoid excess tax deductions, it may pay for corporations to have lessors assume the title and tax benefits of equipment purchases. For that reason, analysts like Timothy W. Summers of Smith Barney, Harris Upham & Co. Inc., a New York brokerage, expect the leasing of large computer systems to increase about 5 percent over the next three to five years. "The alternative minimum tax is going to make large users of dp equipment more wary of depreciation's effect on the income statement," Summers says. He adds that more corporations will probably choose operating leases, under which the lessor takes the deduction, instead of finance leases, under which the user reaps the tax benefits.



Source: Computer Intelligence

Vincent J. Gallo

The new tax laws haven't significantly affected corporate buying patterns regarding large IBM/PCM systems, says Computer Intelligence.

Robert A. Bardagy, executive vice president for Rosemont, IL, lessor Comdisco Inc., discounts the immediate importance of the alternative minimum tax. More corporations are leasing in the first quarter because of product cycles, not taxes, he contends. "Major corporations will have a difficult time figuring out their exposure to the alternative minimum tax this early in the year," Bardagy explains. He expects the alternative minimum tax to become more of a factor toward the end of the year, when corporate deductions begin reaching the limit under the tax.

Bardagy accepts Computer Intelligence's finding that leasing is up, but he asserts that almost 70 percent of IBM and plug-compatible large systems are leased. Bardagy expects Comdisco's leasing volume to show a "marked" increase in the first quarter and is predicting record first quarter revenues. He cites such product cycle changes as IBM's new "E" models of its 3090 mainframes for the increase. With the new models, he says, more of the older 3090 models will find their way into lessors' hands.

A new office architecture

"For the first time, we are offering the power of a mainframe for the price of a department-level system."

That statement, made at a recent press conference by Ken Baker, Control Data Corp.'s marketing manager for computer systems, would have seemed radical two years ago. Today, however, it's becoming a common marketing pitch. In the past year, IBM, Unisys Corp., and now Control Data—with its two new Cyber 930 models—have downsized their mainframe architectures to run in corporate offices rather than data centers.

Analysts are applauding the fact that Control Data, which has lagged badly on product development in recent years, has produced an office mainframe that rivals the offerings of its mainframe competitors. "It's the first time in a long while that people have a reason to buy from Control Data," says Michael Geran, an analyst with E.F. Hutton & Co. Inc., New York.

Analysts and vendors suggest that technology developed for the new office mainframes will become an integral part of future large systems. Several analysts speculate that IBM will replace the water-cooling units in its mainframe line with the air-cooling thermal-conduction unit developed for the IBM 9377 Model 90. Charles A. Kelly, group manager for entry- and medium-level Sperry systems at Detroit-based Unisys, says that the vendor's experience with the VLSI (very large scale integration) components of the Sperry 2200/200 series will help it reduce the size of components in future mainframes. He says

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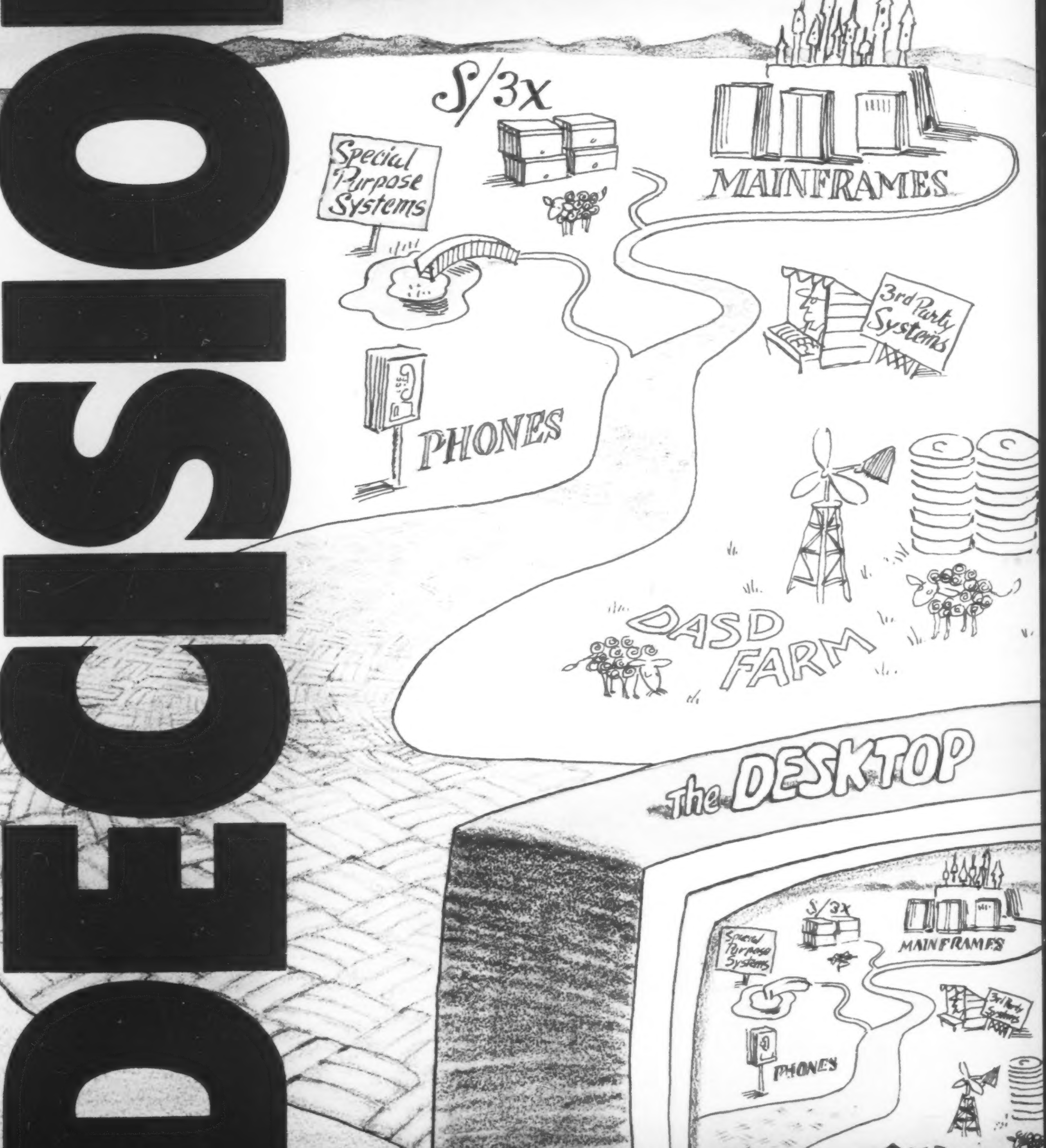
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Results of the initial DECISIONS/Paine Webber Survey indicate MIS spending may be ready to rise, and point to the vendors who will benefit most.

by John Rymer

Can DEC do no wrong? Will IBM do anything right? Respondents to the *Computer & Communications* DECISIONS/Paine Webber Survey of MIS Attitudes currently have a high regard for Digital Equipment Corp. as a vendor, even though about half of them hail from IBM shops. They have been somewhat down on IBM, compared to DEC, but their opinions may soon change for the better, the survey also shows.

The responses of the 1,240 MIS executives and managers who answered our survey shed considerable light on the ongoing contest between IBM and DEC, which has reached a critical juncture. Having established its credentials in networking, DEC is challenging IBM's dominance in corporate data centers. Meanwhile, IBM is developing new products it promises will surpass the functionality and flexibility of DEC's best distributed applications. Right now, DEC is sitting pretty, according to our survey. When asked to give their general opinions of a list of vendors, respondents gave DEC the second highest rating overall (see Figure 5, Vendor Reputation Index). A companion ranking—the Vendor Popularity Index (Figure 4)—shows that a number of respondents' opinions of DEC had improved recently—by a factor greater than for any other vendor.

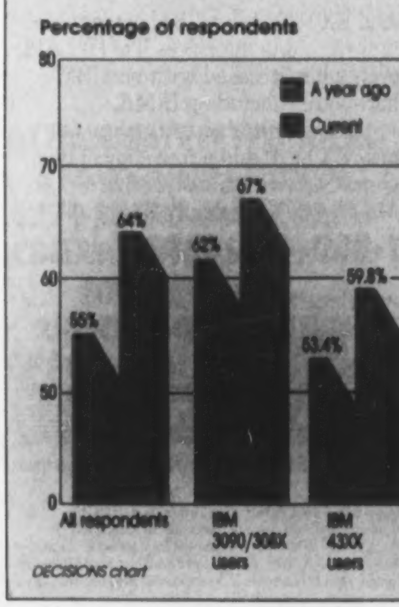
IBM scored lower on both the Vendor Popularity and Vendor Reputation Indexes. But respondents' opinions of, and plans to implement, a variety of products that are key to IBM's anti-DEC strategy—the 937X midrange processor, the Token-Ring Network, Advanced Peer-to-Peer Networking, DB2, and advanced micros—bode well for IBM in the future.

This first of a quarterly series that will be conducted in collaboration with Paine Webber Inc., one of Wall Street's major investment firms, probed the plans and priorities of MIS managers in large corporations to identify key product implementation

Figure 1

CAPACITY INDEX

Percentage of respondents reporting mainframe and mini capacity utilization of 75 percent or greater.



DECISIONS chart

Figure 2

DIGITAL-ANALOG INDEX

Responses to question: "Roughly what percentage of your organization's voice communications were/will be digital in nature?"

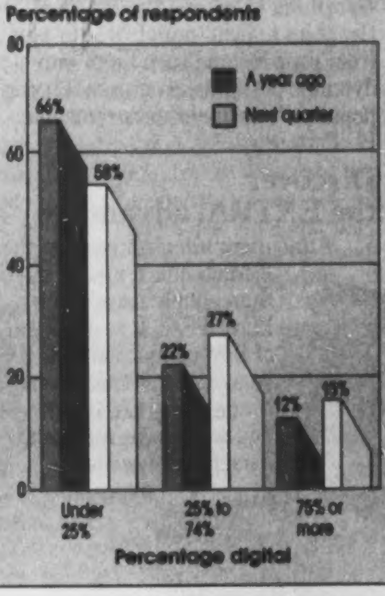
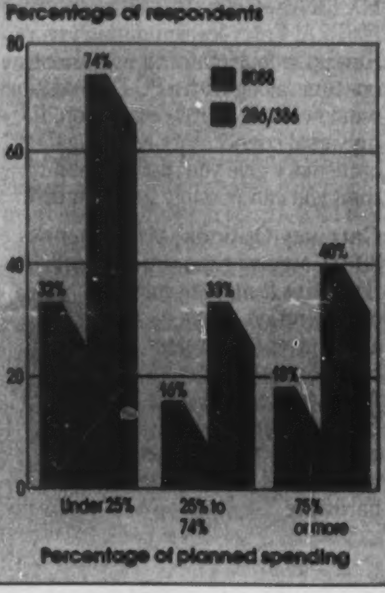


Figure 3

PC SPENDING INDEX

Responses to: "Characterize your planned IBM-compatible micro purchases during the next quarter by type of microprocessor." (286 and 386 processors are combined in chart.)



MIS ATTITUDES

trends. We also asked respondents to report on present capacity utilization. The indexes that accompany this article are the first of many that will be updated quarterly. There are also responses to specific questions about specific systems—like IBM's 937X.

The data we've compiled here reflect the current attitudes of the computer industry's most important customers. Overall response to our survey was outstanding, totaling 24 percent of a sample of 5,126 and representative of thousands of MIS decision makers. Recipients of the questionnaire were chosen at random from key groups among our subscribers: MIS executives, managers, and supervisors in the nation's largest corporations. A supplemental list of 126 "chief information officers" rounded out the sample. Many of the respondents are IBM users: 33 percent operate 3090s, 42 percent have 308Xs, and 37 percent have 43XXs. Almost 25 percent, however, use non-IBM mainframe equipment.

Generally, the survey results point to higher spending by MIS both during the current quarter and the remainder of the year. "I wouldn't say we're in for a boom, but spending plans are more positive than expected," says Stephen K. Smith, vice president for research at Paine Webber. Survey results also suggest what's behind the increase.

IBM's midrange hope

Four separate questions on the survey asked respondents for their opinions of IBM's 937X and their plans for buying and using it. The first conclusion their responses point to is that orders for the 937X are softer than IBM claims. Of the respondents from the general sample who answered the question, "If you plan to buy 9370s, for what purpose will you use them?," 54 percent said they have no plans to buy the 937X. Of respondents with IBM 3090 or 308X mainframes, 49 percent reported no plans to buy the 937X. Fifty-three percent of those with 43XX mainframes don't plan to install the new machine.

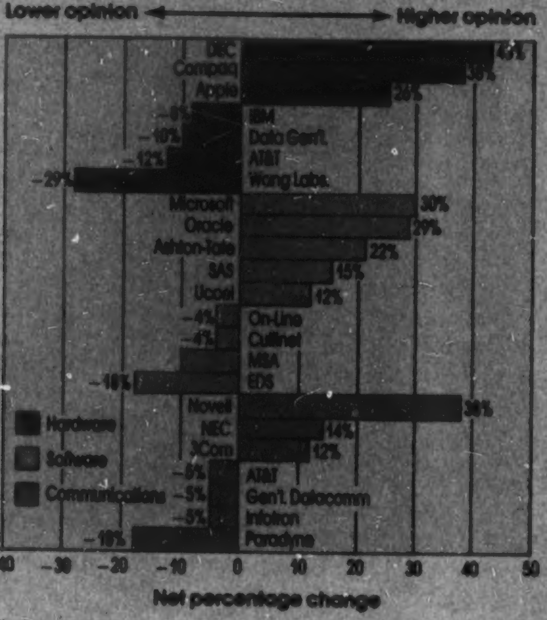
Smith, who follows IBM and other major hardware vendors for Paine Webber, isn't surprised by these results. "The 937X is still being evaluated by MIS," he says, and many of the orders IBM says it has received aren't firm—rather, they reflect the common MIS practice of submitting orders to, in effect, reserve machines. Thus, the 937X's relative success is still an open question; if the evaluations underway go well, Smith believes orders for IBM's new processor will take off.

DEC's VAX is in virtually the same position in respondents' plans as is the 937X. Among the general group of respondents, 49 percent reported having no plans to buy VAXs. However, the figure dropped by only 2 percent for IBM mainframe sites. Together, Smith views these results as a "tre-

Figure 4

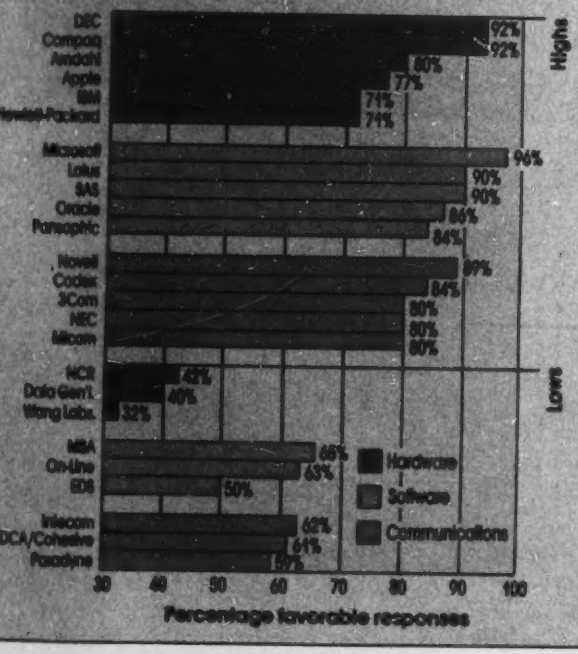
VENDOR POPULARITY INDEX

Ranking based on responses to: "During the last quarter, how has your opinion of the following vendors changed as a potential supplier?" (Chart is a sampling of a 48-vendor survey; highs and lows are represented.)



VENDOR REPUTATION INDEX

Calculated by adding percentage of respondents reporting favorable but unchanged opinion to percentage reporting opinion that changed for the better.



mendous testimony" to DEC and the VAX. "The results say that DEC's success is pretty broadbased," he says. On another question, which asked users about their spending plans with six vendors, the percentage of respondents with large IBM mainframes who said they'd increase spending on DEC products by 25 percent or more (43 percent) was higher than the percentage of respondents overall (37 percent) who would do so, Smith notes.

Smith believes the larger significance of this finding is that DEC's inroad into corporations with large IBM mainframes—the elite of Big Blue's accounts—is proceeding apace. The findings indicate DEC is strong among IBM mainframers, he says.

The respondents also shot holes in IBM's contention that the 937X, which extends the 370 mainframe architecture to the office, will stimulate demand for larger mainframes. IBM's prospects are crucial to Wall Street: Anything that chips at Big Blue's highly profitable mainframe business isn't viewed kindly. Among the general group of respondents to a question on the subject, 19 percent said the 937X would reduce their need for larger mainframes. Only 9 percent indicated the opposite, a difference of 10 points. The remainder expected no change. Roughly the same percentages (20 percent said reduce; 10 percent said raise) held true in 3090/308X sites, but a greater percentage of 43XX user/respondents (24 percent) expected the 937X to reduce their need for larger mainframes. Nine percent thought it would raise their need for bigger computers.

Yet responses to this question must be recognized for what they are: indications of what respondents *expect* to happen. History tells us that IBM's theory about the 937X's effect on mainframe demand is reasonable: The same basic debate erupted when the IBM Personal Computer appeared six years ago, and there's no question now that the PC raised demands for mainframe capacity. Time will tell if the 937X produces the same effect. For the short term, the good news for IBM is that only 15 percent of the respondents from IBM sites said they'd install 937Xs rather than larger—and more profitable for IBM—370-type mainframes.

Smith says the 937X will have a negative effect on demand for larger IBM mainframes, but he believes it won't be manifested for some time. Why? Survey results suggest to him that respondents with IBM systems haven't made rapid progress toward distributed systems. Until they do, the 937X's effect on demand for other systems will be negligible, says Smith.

Other questions on the survey indicate that IBM can expect to get a healthy slice of a bigger MIS spending pie. Forty-nine percent of respondents said their IBM spending would increase. That's almost three times as many respondents who said their IBM spending would fall this year. Thirty-seven percent said their IBM spending this year would exceed last year's by more than 25 percent. Smith believes this is clear evidence that, for IBM, the worst of a two-year spending slump is over.

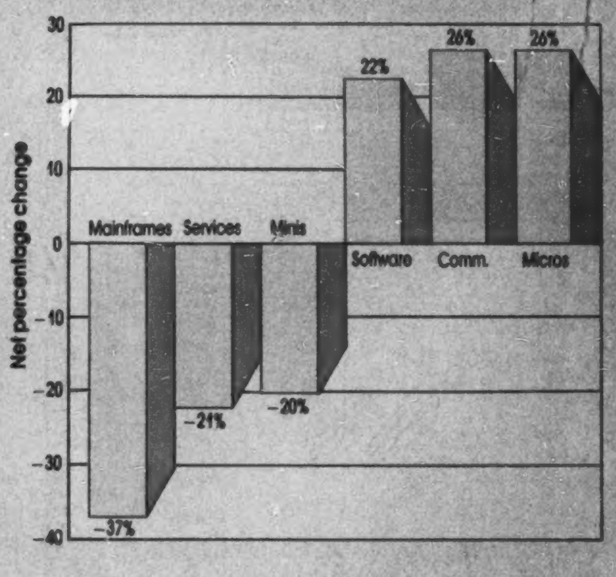
Results from other questions help to explain what's behind this increase. The answers to the question, "Do you anticipate overall your spending for the coming quarter will decrease, increase, or not change from the same period in 1986?," point to higher spending across the board by the base of respondents, a trend that probably will benefit IBM. Micros and communications, and to a lesser extent, software, will be the focus of this

(Continued on page 81)

Figure 6

SPENDING INDEX

Ranking based on responses to question: "For the following categories, do you expect your overall spending for the coming quarter to decrease, increase, or not change from the same period in 1986?"

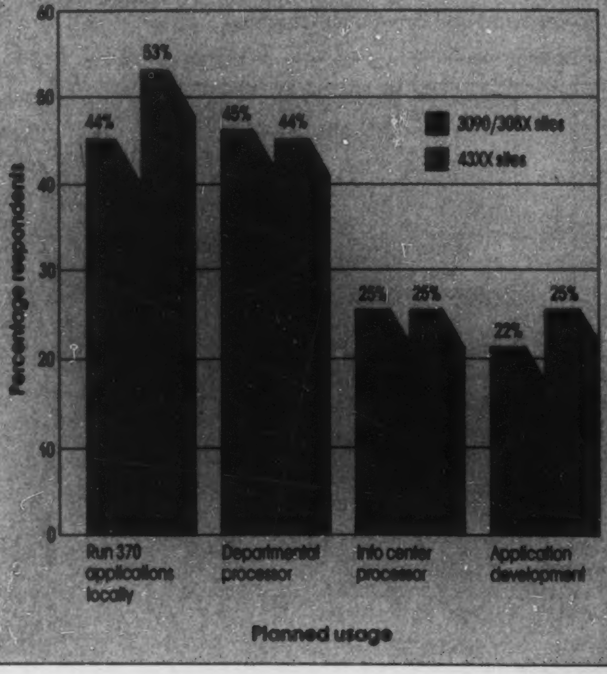


DECISIONS chart

Figure 7

IBM USERS' 937X PLANS

Response by IBM users to question: "If you plan to buy 937Xs, for what purpose will you use them?"



Charts by Denise Barbieri

(Continued from page 76)

increased spending (see Figure 6), and IBM is well positioned in each category, with its advanced PCs (including the new Personal System/2), its Token-Ring Network, and its relational databases. Responses to other questions about which micros, LANs, and DBMSs respondents plan to buy indicate healthy demand for all these IBM products.

In our analysis of the spending priorities of the respondents, mainframes—IBM's cash cows—show the least growth. Respondents were asked whether they plan to buy a mainframe and, if so, which one. Sixty-five percent said no, and although 16 percent said they planned to buy a 3090, demand for 43XX mainframes was about a third of that. Do these results suggest that weak mainframe demand threatens IBM's otherwise bucolic picture? Smith doesn't think so. These numbers shouldn't be taken at face value, he says. "The mainframe spending numbers were much better than I expected," he says.

Smith cites other positive signs for IBM. The percentage of respondents reporting an increase in mainframe and mini capacity utilization of 75 percent or more between last and this year rose (See Figure 1). Capacity utilization is a widely watched indicator of future hardware spending, and vendors typically peg users who cross the threshold of 75 percent utilization to be ready for new larger systems.

Responses also suggest mini spending will be more robust than mainframe spending, a finding that surprised Smith. The trend was most marked among 3090/308X users, Smith notes. "Demand among those users is being driven by the move toward using PCs and networks to distribute processing," he says.

Of course, healthy demand for minis may help to explain DEC's spectacular showing on the question about spending with specific vendors. Those anticipating an increase in DEC equipment purchases outnumbered those planning a decline by almost six to one. The vendor with the gloomiest result on this question was Wang Laboratories Inc. (Lowell, MA). Respondents who said their spending on Wang will decline this year outnumbered those expecting an increase, the only such case among the six vendors included in this question. Flat spending was indicated for the others, Hewlett-Packard Co. (Palo Alto, CA), Data General Corp. (Westboro, MA), and Prime Computer Inc. (Natick, MA).

Responses to the question about spending priorities generally support the notion that corporations are spending more and more on micros and communications. The results of questions about micros suggest two trends. First, significant percentages—as much as 74 percent, in one category—of respondents reported plans to purchase "advanced" IBM-compatible micros—those designed around the Intel 80286 and 80386 microprocessors—which suggests that these machines are the focus of micro spending by MIS. (See Figure 3.)

Second, responses to a different micro spending question suggest that the additional planned "micro spending" will include printers, modems, and software. In that question, respondents were asked which vendors they'd buy micros from next quarter, and which they bought from last year. Each manufacturer registers a drop between the number of respondents who made purchases last year and the number who plan to this year. For example, 83 percent of the respondents to that question said they bought micros from IBM last year, while 69 percent plan to buy from IBM this year.

Does this result point to a reduction in micro spending, contradicting other questions on the survey? Probably not. Planned spending on micros very likely includes more than just the computers themselves. Also, given that respondents indicate plans to buy more high-priced 286- and 386-based micros, they could conceivably spend more in buying from fewer vendors. Finally, the results of this question could simply suggest that lots of respondents hadn't decided who they'd buy from.

Communications directions

Spending on communications is also increasing. For example, respondents indicate that plans to install local-area networks are heating up. Not surprisingly, the focus of our respondents is on IBM's Token-Ring Network and DEC's DECnet and other Ethernet-type LANs. Twenty-four percent of the respondents to this question said they planned to install Token-Ring LANs this quarter; one-third of the respondents with IBM 3090/308Xs said they'll install them.

This is good news for IBM, because it indicates the Token-Ring Network may finally have turned the corner. Criticized by users and consultants as buggy and balky, the Token-Ring got off to a slow start.

DECnet/Ethernet was the next most popular LAN option, at 16 percent, both overall and in IBM mainframe sites. AT&T's Starlan is not as popular an option, with only 3 percent planning to install next quarter, but when compared with last year's 2 percent, the results could be interpreted to mean that its popularity is growing.

Network development

Aside from LANs, where will respondents be directing their attention—and dollars—within the broad category of communications? Another question, which asked respondents which products and standards are most important to their network development plans, suggests answers. Among all respondents to this question, X.25, the international packet-switching protocol, is the top priority, followed closely by IBM's Advanced Peer-to-Peer Networking scheme,

SURVEY METHODOLOGY

The DECISIONS/Paine Webber Survey of MIS Attitudes was conducted by mailing questionnaires to 5,000 *Computer & Communications* DECISIONS subscribers randomly selected from a larger group of subscribers holding managerial titles within MIS organizations in large corporations. Questionnaires were also sent to a supplemental list of 126 chief MIS executives at the nation's largest corporations.

The questionnaires were mailed during the third week of February with a March 25th deadline. By the deadline, 1,240 responses—24 percent of the sample—had been received.

The responses were tabulated and analyzed by SPSS Inc. (Chicago), using SPSS-X, a statistical analysis and data management package for large systems.

IBM's Netview network management system, and DECnet. These results are shuffled when looking at IBM mainframe sites. Not surprisingly, Netview and APPN are the top priorities for those respondents.

The fifth and sixth priorities were electronic data interchange (EDI), a networking technology aimed at reducing paperwork, and ISDN, the Integrated Services Digital Network standard proposed to make the public phone network a flexible data highway system. AT&T, ISDN's chief proponent, has only recently announced products implementing the standard, and analysts don't expect ISDN to become a widely available option for users until the next decade arrives.

Responses to another question suggest that the long-heralded era of integrated—digital—voice and data communications is still only nascent. One question asked what percentage of the communications at respondents' organizations were digital in nature last year and will be digital in the next quarter. The largest group of respondents said under 25 percent, but their numbers are gradually declining. Of those respondents, 66 percent said under 25 percent of their organizations' communications were digital last year. Fifty-eight percent of the respondents to this question said they expected digital communications to be less than 25 percent or less of their organization's total next quarter. (See Figure 2.)

The responses on digital communications surprised Jack Grubman, Paine Webber's communications analyst. "If digital communication isn't as pervasive as people think it is, and if it is growing, then there might actually be life left in the PBX business," he says. Grubman is reevaluating the growth prospects of the PBX vendors, particularly AT&T and Northern Telecom (Nashville, TN).

DBMS: An IBM onslaught

IBM is successfully raising its revenues from software (see Performance Report, page 119), and the results of questions about DBMSs help to explain why. In the race for the lead in new installations in what might be described as the relational era, IBM's relational DBMSs, DB2 and SQL/DS, have jumped out to take big leads. According to our results, Oracle from Oracle Corp., Belmont, CA, is the only IBM competitor mounting a serious challenge to IBM. IBM's gains, according to these results, will be principally at the expense of its own IMS DBMS and IDMS/R from Cullinet Software Inc., Westwood, MA. Cullinet has a healthy installed base among respondents (14 percent), but few (1 percent) plan new installations of IDMS/R as their primary production DBMS. However, all other IBM competitors on our list, with the exception of Oracle and Relational Technology Inc. (Alameda, CA), makers of Ingres appear to share Cullinet's woes.

DB2's lead in the DBMS race is substantial. Overall, 13 percent of the total sample reported plans to install DB2 as a primary DBMS, double the number that have already installed it for this purpose. No other product showed such strength in the results. Only SQL/DS showed an increase—from 3 percent to 3.5 percent; for all other products, the percentage of respondents who indicated plans to install was lower than the percentage of those currently using the product.

> ***DEC's VAX is in virtually the same position in respondents' plans as is the 937X.***

Responses to our survey indicate, however, that distributed databases are clearly the leading edge of DBMS technology. Only 18 percent of the respondents said they were "moving ahead" with distributed DBMSs this year. Seventy percent of the respondents to a question asking about attitudes toward distributed relational DBMSs indicated they were waiting and watching. Of those, 40 percent characterized the technology as being "too immature to seriously consider," and 16 percent said they were waiting for an IBM offering.

Popularity contest

Our Vendor Popularity and Vendor Reputation Indexes give the highs and lows among hardware, software, and communications equipment vendors in two parts. The Vendor Popularity Index provides an indication of how a vendor has fared among repondents who've recently changed their opinions about it. The index is the difference between the percentage of respondents who said they've recently changed their opinions for the better and those who said their opinions changed for the worse. The Vendor Reputation Index is a long-term measure. It is the sum of the percentages of respondents who indicated a favorable opinion, either changed or unchanged. Each index is revealing, but neither in itself shows the entire picture of a vendor's standing in the minds of respondents.

There were few surprises among the top and bottom finishers in this popularity poll. DEC has been riding high, and Compaq's reputation apparently was enhanced by last fall's announcement of a micro based on the 386 chip. Apple did much to change opinions among MIS managers in the early part of this year: It finally announced an "open" Macintosh and communications facilities corporate MIS had been demanding.

Microsoft Corp., Redmond, WA, was first among the micro vendors in popularity. Microsoft, Lotus Development Corp. (Cambridge, MA), and Ashton-Tate (Torrance, CA) each scored far better among respondents than did mainframe software vendors. Bob Therrien, Paine Webber's software and services analyst, believes micro software enjoys a reputation for helping meet user applications needs. "Mainframe software vendors show up less positively, because dp has had longer experience with them and more time to get crusty about them," he says.

The lowest marks in the software and communications groups were suffered by Electronic Data Systems, the Dallas-based General Motors subsidiary late under Ross Perot's leadership, and by Paradyne Corp. (Largo, FL), the data comm hardware supplier. Each of these results was not unexpected, and may be due as much to recent (particularly in EDS' case) bad publicity about company management as much as it is the result of respondents' experiences. Is it fair to consider such publicity? Certainly. Anything that affects the opinions of MIS managers is part of the challenge for vendors in a crowded marketplace. **D**

The next in this series of Computer & Communications DECISIONS*/Paine Webber Surveys on MIS Attitudes will appear in our September issue.*

Chuck Nacke/Picture Group

Henry Hilliard/Picture Group

Courtesy of Sun Microsystems

Leaders (left to right): Tse of Wyse Technologies, Foster of Stratus Computer, and McNealy of Sun Microsystems.

PERFORMANCE REPORT

Systems & peripherals: Winners and losers of 1986

IBM slowed and DEC crowed. Smaller vendors found exploring new markets the strategy for success, the first of DECISIONS Performance Reports reveals.

by Lee Keough

Last year at The Stanley Works, information systems spending slowed. National economic conditions, combined with product and investment cycles, had slaked the giant New Britain, CT-based hardware and tools manufacturer's thirst for more computers.

This year is different. Data processing spending will increase, although not dramatically, says James B. Gustafson, Stanley's director of information systems. The upswing reflects the top brass' recognition that investments in information systems are necessary to achieve a strategic advantage over their competition, he says. Moreover, Gustafson's spending patterns are changing. Instead of buying all Big Blue boxes, Gustafson plans moderate increases in his budget for IBM systems with significant dollars now earmarked for Digital Equipment Corp.'s VAX minicomputers.

Gustafson is not alone. That's clear from DECISIONS' Large Systems survey, which tracks the yearly performance of the dominant processor and peripheral vendors. IBM's financial results for 1986 were dismal, although many expect better times ahead (see "IBM's slump: Your opportunity," page 124). The prime beneficiary among vendors of IBM's troubles—and the resounding market winner—was, of course, DEC.

The success of DEC and other vendors had analysts hailing the end of hard times for the computer industry. "The so-called slump is not a slump anymore," says Will Zachmann, vice president at International Data Corp., Framingham, MA. "Those who are riding the wave of new technology are doing fantastically," he adds, referring to vendors of smaller systems and systems based on microprocessors. Sun Microsystems Inc. and Stratus Computer Inc. exemplify this trend. Each enjoyed robust sales growth in 1986. Also doing well are Tandem Computers Inc., which is benefiting from the trend toward distributing processing, and Cray Research Inc., proving that the demand for supercomputers is still hot as users find new applications for these fast, powerful, and expensive systems.

The DECISIONS survey ranks vendors by 1986 total data processing revenues—not just sales from large systems—and compares them to 1985 performance. Vendors are arranged by their main lines of business. Processor vendors are grouped separately from those whose primary business is to market peripherals or sell computers to the scientific and engineering markets.

From the survey, it is clear that traditional large systems vendors grew slowly last year, gaining only 5 percent over 1985, an equally slow year. But IBM, one of the worst performers, skewed the results. When IBM is removed from the picture, the remaining large systems vendors averaged a 9 percent gain.

Zachmann, who was one of the first industry watchers to predict a deep and enduring computer slump, credits the move to smaller systems and a flat economy for forming the underly-

'86	'85	Company	'86 Dp Revenues (000)	'85 Dp Revenues (000)	% Growth
		Processors			
1	1	IBM *(Armonk, NY)*	**49,300,000**	48,100,000	2
2	2	Unisys Corp.* *(Blue Bell, PA)*	**9,536,700**	9,058,100	5
3	3	Digital Equipment Corp. *(Maynard, MA)*	**8,414,309**	7,029,407	20
4	4	NCR Corp. *(Dayton, OH)*	**4,377,588**	3,883,563	13
5	5	Hewlett-Packard Co. *(Palo Alto, CA)*	**3,950,000**	3,700,000	7
6	6	Control Data Corp. *(Minneapolis, MN)*	**3,346,700**	3,679,700	−9
7	7	Wang Laboratories Inc. *(Lowell, MA)*	**2,668,900**	2,428,300	10
8	8	Honeywell Inc. *(Minneapolis, MN)*	**1,900,000**	1,700,000	12
9	9	Data General Corp. *(Westboro, MA)*	**1,287,600**	1,190,280	8
10	10	Amdahl Corp. *(Sunnyvale, CA)*	**966,349**	862,032	12
11	11	Prime Computer Inc. *(Natick, MA)*	**860,173**	769,673	12
▲12	14	Tandem Computers Inc. *(Cupertino, CA)*	**835,767**	634,546	32
▼13	12	Texas Instruments Inc. *(Dallas)*	**750,000**	760,000	−1
▼14	13	National Semiconductor Corp. *(Santa Clara, CA)*	**700,000**	650,000	8
▲15	17	Cray Research Inc. *(Minneapolis, MN)*	**596,685**	380,158	57
▼16	15	Harris Corp. *(Minneapolis, MN)*	**464,000**	500,000	−7
▼17	16	Datapoint Corp. *(San Antonio, TX)*	**322,776**	414,682	−22
▲18	20	Gould Inc. *(Rolling Meadows, IL)*	**300,000**	248,000	21
▼19	18	MAI Basic Four Inc. *(Tustin, CA)*	**287,857**	249,405	15
▲20	23	Recognition Equipment Inc. *(Dallas)*	**241,795**	163,147	48
▼21	19	Concurrent Computer Corp. *(Holmdel, NJ)*	**235,849**	267,785	−12
22	22	NBI Inc. *(Boulder, CO)*	**165,000**	172,000	−4
▲23	25	Altos Computer Systems *(San Jose, CA)*	**139,481**	132,182	6
▲24	28	Computer Consoles Inc. *(Rochester, NY)*	**129,600**	111,880	16
▲25	30	Stratus Computer Inc. *(Marlboro, MA)*	**124,559**	80,164	55
		Total Processors	**91,901,688**	87,165,004	5
		Processors without IBM	**42,601,688**	39,065,004	9
		Peripherals			
1	1	Xerox Corp. *(Stamford, CT)*	**1,890,000**	1,609,000	17
2	2	Memorex Corp. *(Santa Clara, CA)*	**906,000**	835,000	9
▲ 3	5	Telex Corp. *(Tulsa, OK)*	**741,621**	597,426	24
▼ 4	3	Storage Technology Corp. *(Louisville, CO)*	**696,000**	673,400	3
▼ 5	4	ITT Corp. *(New York, NY)*	**631,250**	625,000	1
6	6	Bell & Howell Int'l. LV *(Skokie, IL)*	**263,200**	236,800	11
7	7	General Dynamics Corp. (Datagraphix Inc.)** *(San Diego, CA)*	**240,700**	225,000	7
▲ 8	10	Wyse Technology *(San Jose, CA)*	**228,360**	120,478	90
▼ 9	8	Decision Industries Corp. *(Horsham, PA)*	**195,083**	176,378	11
▼10	9	National Computer Systems Inc. *(Minneapolis, MN)*	**190,254**	139,685	36
▼11	13	Lee Data Corp. *(Eden Prairie, MN)*	**109,443**	88,366	24
12	12	System Industries Inc. *(Milpitas, CA)*	**109,308**	95,705	14
▼13	11	Televideo Systems Inc. *(Sunnyvale, CA)*	**91,462**	103,088	−11
		Total Peripherals	**6,292,681**	5,525,326	14
		Scientific and Engineering			
1	1	Intergraph Corp. *(Huntsville, AL)*	**605,737**	526,405	15
2	2	Computervision Corp. *(Bedford, MA)*	**494,672**	441,944	12
▲ 3	7	Lockheed Corp.* *(Calabasas, CA)*	**440,000**	160,000	175
4	4	Apollo Computer Inc. *(Chelmsford, MA)*	**391,685**	295,575	33
▼ 5	3	Tektronix Inc. *(Beaverton, OR)*	**387,825**	412,875	−
▲ 6	8	Sun Microsystems Inc. *(Mountain View, CA)*	**341,088**	147,100	13
▼ 7	5	Schlumberger Ltd. *(New York, NY)*	**245,000**	214,000	1
▼ 8	6	Gerber Scientific Inc. *(South Windsor, CT)*	**209,075**	210,387	−
9	9	Daisy Systems Corp. *(Mountain View, CA)*	**95,956**	133,637	−2
10	10	Valid Logic Systems Inc. *(San Jose, CA)*	**60,907**	56,057	
		Total Scientific and Engineering	**3,271,945**	2,597,980	2
		Total Processors and Peripherals	**98,194,369**	92,690,330	
		Total Large Systems	**101,466,314**	95,288,310	

Total '86 Revenues (000)	Total '86 Profits (000)
51,250,000	4,789,000
9,536,700	(43,400)
8,414,309	861,588
4,881,641	336,524
7,102,000	516,000
3,346,700	(264,500)
2,668,900	(86,400)
5,378,200	(398,100)
1,287,600	(26,800)
966,349	41,829
860,173	46,925
835,767	79,215
4,974,000	29,100
1,678,000	(53,600)
596,685	124,815
2,106,428	69,592
322,776	(4,992)
908,000	34,600
287,857	10,406
241,795	10,539
235,849	4,804
283,087	(5,173)
139,481	19,075
129,600	(2,977)
124,559	13,519
12,919,000	465,000
906,000	N/A
816,977	69,734
696,000	36,000
7,595,540	493,720
853,409	32,895
9,211,400	(52,500)
228,360	16,664
195,083	7,750
190,254	16,332
109,443	2,588
109,308	4,636
91,462	(2,272)
605,737	70,362
494,672	(5,774)
10,273,000	408,000
391,685	9,331
1,352,409	55,131
341,088	30,607
4,938,420	(2,017,591)
209,075	19,131
95,956	(1,081)
60,907	(7,067)

*Adjusted to reflect acquisition for CY '86

**Datagraphix sold to Anacomp Inc. in CY '87

ing dynamic in the industry. "The economy causes more budget pressure, and when people are buying large systems, there is more rigorous scrutiny. That provides a powerful incentive for users to meet their needs with smaller systems. The right strategy is to put as much as you can on the desktop and move it off only if there is no other choice," he says.

Gustafson is following that strategy to the letter. Gustafson is moving applications off the mainframe, and says DECnet and a single architecture make the VAX an obvious choice as the cornerstone for new systems. He might have selected one of IBM's 937X machines, but "I can't wait for it," he says.

Confirming that view is David S. Currence, systems planning manager for Westinghouse Electric Corp., Pittsburgh. Currence notes that a micro yields more MIPS (millions of instructions per second) per dollar than a mainframe, so it makes sense to move toward distributed processing. "We're still buying mainframes, but more and more we are turning them into network engines [serving smaller processors]," Currence says. Because the economy has expanded a bit, there has been a slight relaxation on budget constraints, Currence adds. But those dollars won't be spent according to spending patterns of the past.

Also working against traditional systems vendors is the newfound independence of MIS managers, who are more likely to seek out bargains from plug-compatible and other vendors, and the aging product lines of many of the larger vendors, such as IBM, Unisys Corp., and Hewlett-Packard Co. "In the last couple of years there has been little to spark interest, no major breakthroughs in technology," says one MIS director who asked not to be named.

"Everyone looks for magic when a company does well," says Rick Martin, an analyst with Sanford C. Bernstein, a Wall Street brokerage. "DEC, for example, is near the beginning of its product cycle with many of its VAXs. You can do a fantastic business replacing your installed base, but it's not magic."

DEC is particularly fortunate to have a strong product line at a point when IBM is weak. The only relatively new IBM product shipped last year was the 3090 mainframe. Says Zachmann, "Without that, IBM would have been in really bad shape." Even though the 3090 sold well, Zachmann says it doesn't disprove his theory of downsizing for success. "IBM didn't sell many more 3090s than it did 3080s," when 3080s were originally shipped, he says.

Other vendors, such as Data General Corp. and Wang Laboratories Inc., lost out to DEC's message of a single architecture and networking ease. DEC, many observers note, has become as safe a supplier as IBM, and that's not only to IBM's detriment.

Datapoint Corp., which sells a proprietary system and has been embroiled in corporate controversy, reported the worst results in this category. Those results don't reflect the efforts of Doris Bencsik, Datapoint's new chief executive officer, to turn Datapoint around. Since replacing Edward P. Gistaro early this year, she's ordered a complete restructuring, including layoffs and writeoffs.

The peripherals market, led by Xerox Corp., Wyse Technology, and Telex Corp., turned in a better average performance than its systems counterparts, growing by about 14 percent over the previous year. But the comparative swings between vendors varied widely, reflecting the several subdivisions of the peripherals market, including printers, terminals, and storage devices. Peripherals sales are largely tied to those of systems, and the lackluster performance of many systems vendors weighed down the demand for peripherals.

Yet there were other factors. Xerox, for example, has had significant success in selling nonimpact printers, currently a hot market. Affordable laser printers are opening up new applications to users. Kathy Dingman, an analyst at CAP International, Marshfield, MA, a market researcher specializing in printers, says vendors are benefiting as a transition from impact to nonimpact printers takes place. U.S. vendors, which comprise the DECISIONS list, scored particularly big since they did not have to battle a rising yen, she says.

This doesn't explain the success of Wyse and Telex, however, two leading terminal vendors. Both are the leading nonprocessor vendors in their respective markets, with Wyse heading the ASCII and ANSI market, and Telex winning in the 3270 arena. Other vendors, such as ITT Corp. and Televideo Systems Inc., are having more difficulty in these highly competitive, low-price, low-margin markets. A chief reason for the success of Wyse and Telex, however, was their willingness to start new businesses.

Bernard Tse, chief executive officer of Wyse, says he can keep even with the competition in terminals by offering more features and reducing costs through engineering and design. Yet Tse is gaining ground by moving into the sale of micros, monitors, and high-resolution graphics displays. Last year Wyse also acquired Amdek, a leading vendor of monitors for the IBM Personal Computer. Tse envisions that other vendors' micros based on Intel Corp.'s 80386 chip will continue to spur demand for his company's new products.

Telex has also moved beyond merely offering 3270 terminals and controllers. It, too, has expanded into micros and now sells terminals for IBM System/3X minis.

Sales of storage products also correlate to system sales, but Memorex Corp. and Storage Technology Corp., along with Amdahl Corp. and National Advanced Systems, the IBM plug-compatible subsidiary of National Semiconductor Corp., grew directly at IBM's expense. "As a whole, the storage market is growing at the same rate as systems sales," says Dave Vellante, storage analyst at IDC. "But the PCMs are gaining on IBM." This is because PCMs now offer cheaper, but equally reliable disk drives, and more varied product lines.

Courtesy of Datapoint

Better times ahead? New CEO Doris Bencsik has moved quickly to get Datapoint Corp. back on track.

ON THE FAST TRACK . . .

Company	'86 Revenues (000)	% Growth	'85 Revenues (000)
1 Lockheed Corp.*	440,000	175	160,000
2 Sun Microsystems Inc.	341,088	132	147,100
3 Wyse Technology	228,360	90	120,478
4 Cray Research Inc.	596,685	57	380,158
5 Stratus Computer Inc.	124,559	55	80,164
6 Recognition Equipment Inc.	241,795	48	163,147
7 National Computer Systems Inc.	190,254	36	139,685
8 Apollo Computer Inc.	391,685	33	295,575
9 Tandem Computers Inc.	835,767	32	634,546
10 Telex Corp.	741,621	24	597,426

**Adjusted to reflect acquisition for CY '86*

. . . IN THE SLOW LANE

Company	'86 Revenues (000)	% Growth	'85 Revenues (000)
1 Daisy Systems Corp.	95,956	-28	133,637
2 Datapoint Corp.	322,776	-22	414,682
3 Concurrent Computer Corp.	235,849	-12	267,785
4 Televideo Systems Inc.	91,462	-11	103,088
5 Control Data Corp.	3,346,700	-9	3,679,700
6 Harris Corp.	464,000	-7	500,000
7 Tektronix Inc.	387,825	-6	412,875
8 NBI Inc.	165,000	-4	172,000
9 Texas Instruments Inc.	750,000	-1	760,000
10 Gerber Scientific Inc.	209,075	-1	210,387

DECISIONS chart

The one group of vendors that enjoyed high growth rates in 1986 were those selling to computer-aided design/manufacturing and other scientific and engineering markets. Lockheed Corp. showed a large increase primarily because of its acquisition of Sanders Associates, Nashua, NH, which almost doubled its size. But Sun Microsystems achieved an astounding 132 percent growth rate without any acquisitions.

The demand of engineers for distributed processing and single-user workstations is what enabled Sun—and, to a lesser extent, Apollo Computer Inc.—to grow at such a high rate. Until low-cost engineering workstations became available, teams of engineers shared workstations, enduring lengthy response times while the computer worked on a colleague's problem. Apollo has lagged because its product cycle is a step behind Sun's, says David Burdick, director of CAD/CAM research for San Jose-based Dataquest. Apollo recently introduced new workstations, and Burdick expects both Apollo and Sun to continue growing at a fast pace.

The success of Apollo and Sun didn't damage CAD/CAM vendors such as Computervision and Intergraph last year, says Burdick. They are emphasizing software and peripherals rather than computer systems. Rather, minicomputer vendors with a strong presence in engineering and the factory, such as Data General Corp. and Prime Computer Inc., are losing ground to Sun and Apollo.

It seems as though some vendors, like Data General, are losing ground at every turn. Whether they have the stamina and acumen to adjust to new market conditions will determine whether they will survive the 1990s. "The fundamentals are only going to get worse," warns Zachmann.

Not everyone agrees, of course. "There is a degree of saturation at the current level of computing," says Kimball Brown, a Dataquest analyst. "Before 1980, you had to be a programmer to use a computer. The PC brought the end user in, but there hasn't been much progress since then. Once everything can be networked, the end-user pie will grow, and unit shipments of large systems will skyrocket." A lot of vendors hope Brown, not Zachmann, has the right crystal ball. **D**

PERFORMANCE REPORT

IBM's slump: Your opportunity

As Big Blue ponders ways to woo new customers and keep the faithful from straying, it must listen to MIS.

by Lee Keough

MIS managers will enjoy an advantage in dealing with IBM this year if, as Shakespeare wrote, "What's past is prologue . . ." IBM's response to last year's huge drop in demand for its products in this country and poor sales worldwide was to reduce prices, ramp up new product introductions, and outline new strategies to answer customers' complaints. Because IBM's precipitous decline in profits has not been reversed, users can expect to get sweeter deals and better products from Big Blue this year. Indeed, IBM has dubbed 1987 the "Year of the Customer," vowing to be more responsive to users' needs.

Within the last nine months, IBM has embarked on a new architectural initiative, Systems Application Architecture; announced a long-awaited new family of microcomputers; introduced the first office computers that can run software for its mainframes; improved the performance of its systems; and reduced the price of its most important product, the 3090 mainframe.

Although these announcements promise to reshape information processing for the rest of this century, they will not do much for IBM this year, analysts say. So to keep users from defecting to the competition when they need to build new applications, IBM is likely to continue improving its prices and products. Expected new offerings include a midrange processor family that will run applications written for either the System/36 or S/38 and a triple-density, 7.5-gigabyte disk drive.

"Right now, IBM is on the defensive," says Charles T. Casale, director of research for the Yankee Group, Inc., Boston. "That will change within one to one and a half years, and that's when we'll see a spectacular battle for new applications [between IBM and other vendors, particularly Digital Equipment Corp.]."

Until then, Casale and others predict IBM will make incremental gains in the market—and its bottom line. "Circumstances are getting better for IBM because it is making steady, slow, unglamorous progress in the connectivity arena," Casale asserts.

Casale is referring to IBM's additions to its communications architecture, SNA, not to its newly announced software architecture, SAA. SAA will not take shape in marketable form for years—some analysts predict SAA will be available in two years, others say it won't be a reality until the next century. Yet SAA is expected to give IBM's marketing forces some relief long before it becomes a complete architecture. (See "SAA: master plan or grand illusion?," page 85).

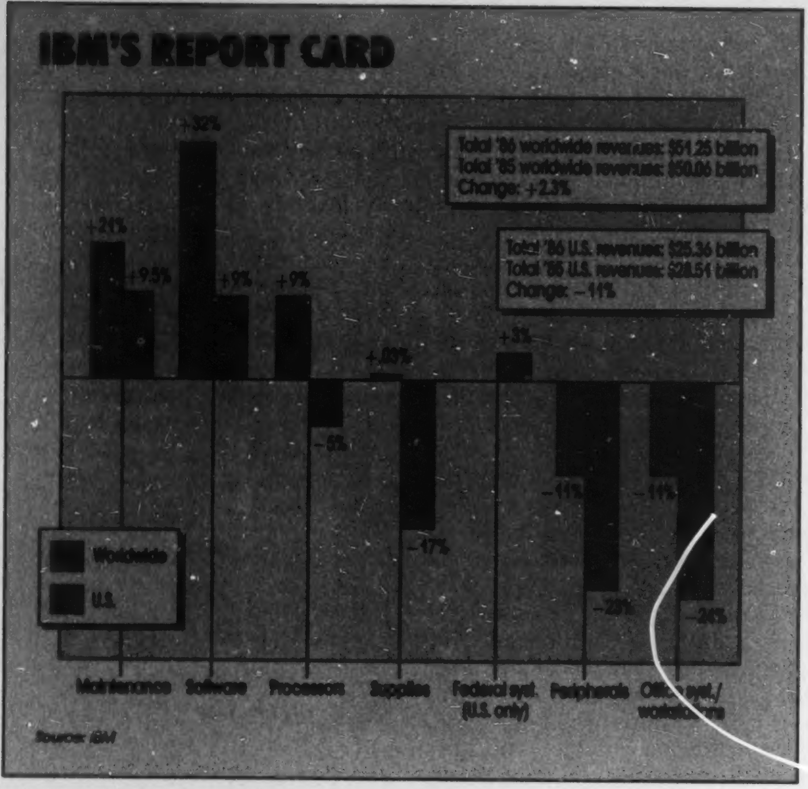
"What IBM is hoping for, and what might occur, is that SAA will loosen the purse strings of its customers now," says Michael Braude, software analyst at the Gartner Group Inc., Stamford, CT. Braude does not think SAA will become a reality for several generations of hardware. He likens it to its sibling, SNA, which was announced 13 years ago and has just begun to take complete form.

What SAA does for IBM now is provide a response to the competitive threat posed by DEC, which is enjoying great success selling its unified software architecture. Will Zachmann, vice president of International Data Corp., Framingham, MA, calls SAA the plaster with which IBM is smoothing over the cracks between its hardware lines. DEC doesn't need such plaster—its structure is sound. "SAA only puts them even with DEC," says Zachmann. "But IBM was dead meat without it."

Even if SAA is only a future solu-

Andrew Popper/Picture Group

IBM chairman John Akers's challenge: Introduce fundamental change while stemming profit shrinkage.



Source: IBM

Susan Bonto

Worldwide, IBM grew slightly more than 2 percent last year, but U.S. sales were down significantly. With the exception of software, maintenance, and government sales, IBM experienced precipitous drops in each of its markets.

tion, it should forestall user defections to competitive proprietary systems. "It should help IBM sell hardware in the short term," says Carl Claunch, director of systems planning for National Advanced Systems Inc., the Mountain View, CA-based vendor of IBM plug-compatible systems. Over the long term, a fully developed SAA could make it easier for hardware and software manufacturers to compete with IBM. Claunch envisions a future in which all software written for IBM systems can run on, for example, NCR Corp. processors. He also expects competitors to come with alternative operating systems for IBM processors.

"From a competitive standpoint, SAA is a double-edged sword for IBM," says Tony Percy, director of product planning for Applied Data Research Inc., a Princeton, NJ, software vendor. Once IBM commits to a standard, such as its Structured Query Language, it allows competitors such as ADR to compete with IBM head to head. Standards negate IBM's biggest weapon: fear that IBM will change the rules.

Says Braude: "SAA creates a level playing field. It will make it easier for users to mix and match software vendors. It doesn't make it easier to compete with IBM. It makes competition more straightforward."

Also in IBM's arsenal in its battle against DEC: the new 937X midrange processor line. Most analysts agree that IBM was forced to unveil the minicomputer because of its dismal performance against DEC. Observers are debating whether the 937X will be the success IBM is hoping for, and question whether moving the shipment date from September to June will have much of an effect on IBM's financial results for this year. (For a related analysis, see "The DECISIONS/Paine Webber Survey of MIS Attitudes" on page 74.)

"IBM originally said it would ship between 2,000 and 3,000 [937Xs] this year," says Rick Martin, an analyst with Sanford C. Bernstein & Co., a Wall Street brokerage. "By advancing it, it should sell between 4,000 and 6,000. I would be shocked if it didn't."

But Brian Jeffery, research director at International Technology Group, Los Altos, CA, is among naysayers who believe the 937X will disappoint IBM. Most current orders are "soft," he says, with users merely saving a place in line. He does not believe many users are planning to buy the 937X as a departmental machine and says IBM itself only expects 10 percent to 15 percent of its customers to purchase it for office use. Jeffery says most of the systems will be sold to small and medium-sized businesses, through new channels such as the Extended Enterprise Program. The Extended Enterprise Program awards large end users huge discounts if they resell IBM equipment to affiliated businesses. For example, an auto manufacturer may buy thousands of 937Xs to resell to its dealerships, a captive market.

What's wrong with this scenario, says Jeffery, is that many end users will be competing against one another and hence overestimate sales, leading to soft orders. Beyond sales to small and medium businesses, Jeffery says the 937X will be a replacement business. "It's not going to carve out its own niche," he says.

Martin, a former product manager for the IBM 43XX series, doesn't buy Jeffery's assessment. Although he agrees there isn't a huge market for departmental processors, Martin says it is wrong to conclude the 937X will be unsuccessful. Virtually all IBM's sales—in good times or bad—are to existing installations. New, wide-open markets are few, but that is as true for DEC as for IBM, Martin argues. As a result, Martin expects enormous sales because the demand for replacements for the 43XX—previously the low end of IBM's mainframe architecture—is high, and the 937X product cycle is just beginning. IBM's business cycles have always behaved like this, but were masked by IBM's steady stream of rental revenues, which no longer exists. The 937X is expected to eliminate the last vestige of IBM's rental income, because the 43XX comprises the bulk of IBM equipment remaining on lease.

The difficulty IBM has had in selling midrange processors has been so severe that the new 937X may not be enough to reverse IBM's fortunes. Most analysts predict IBM will soon unveil a successor to its System/36 and S/38 minicomputers, code-named Silverlake.

Martin says both Silverlake and the 937X trace their heritage to a failed IBM development project called Fort

Knox. Based on reduced instruction set computing (RISC) technology, Fort Knox was intended to run Unix as well as software written for the System/370 and System/3X. It was to be most efficient when running a new operating system. If that sounds too ambitious, there should be little surprise that the project failed.

DEC and the midrange has not been IBM's only problem. IBM has watched its market share in microcomputers erode dramatically. Although IBM's revenue explosion from micros peaked in 1984, it wasn't until last year that low-cost Personal Computer clones really began to affect IBM's finances. The solution? IBM introduced a new family of micros and a new operating system that allows IBM to regain control of the market.

The new micros, the Personal System/2 series, will not have much impact on revenues until next year, when OS/2, its new operating system, and the more powerful models of the series become available. Strangely enough, analysts are crediting the announcement with boosting sales of IBM PCs and clones. "PS/2 unfroze the market," says Casale. "Users are no longer paralyzed by FUD [fear, uncertainty, and doubt]."

Although analysts do not expect IBM to garner a big revenue boost from the PS/2 this year, they believe it could help increase profits. Martin estimates IBM's margins on the micros at 70 percent. "For that reason, the PS/2 is a very, very big deal," he says. "I look for the PS/2 to add $600 million to $900 million in profit to the corporation this year."

Once the Extended Edition of OS/2 begins shipping, it will provide an additional lift to software revenues. OS/2 will cost from $400 to $800, whereas PC-DOS costs about $100.

Yet software is hardly the market in which IBM needs help. Since 1980, IBM has evolved from obtaining almost all sales and profits from hardware to now earning more than a tenth of its revenues from software. "The growth in hardware is gone forever," says Jeffery. "IBM is halving the price of hardware every three years, so to grow, it has to increase hardware volume and software and service revenues." IBM has accomplished this high growth by hiking the price of its operating system software, unbundling it from the cost of hardware, and introducing new products. (See chart.)

"I expect software revenues to increase 28 percent to 33 percent for the next four to five years, but not through price hikes," says Braude. IBM has raised the cost of operating system software about as high as it can, he argues. Instead, Braude is looking for IBM to make gains in "applications enabling vehicles," such as TSO, and vertical applications packages for banks, manufacturers, and others. Most importantly, Braude expects sales of hardware, including the 937X, to drive software gains.

Sales of IBM's 3090 mainframes have been particularly lucrative, from both a hardware and software perspective. Initially blamed for IBM's financial slump, observers pointed to its lack of differentiation from its predecessor, the 308X, as the cause of IBM's troubles. Analysts have since changed this tune. Says Bob Djurdjevic, a DECISIONS columnist and president of Annex Research, Phoenix: "The 3090 was very, very successful and one of two recent products that met IBM's expectations, the other being the PC AT."

> ***"SAA only puts them [IBM] even with DEC. But IBM was dead meat without it."***

But because IBM's two direct competitors in the mainframe market, NAS and Amdahl Corp., Sunnyvale, CA, are aggressively marketing 3090 compatibles, IBM can no longer count on being its most powerful mainframe to bolster revenues and profits. For that reason, speculation regarding Summit, the 3090's successor, is kicking into high gear.

Jeffery argues that IBM has never gone more than a year without some form of mainframe processor introduction, and that the 3090's per-processor performance deteriorates each time a processor is added. Some analysts believe that since the 3090 now consists of up to six processors, IBM is likely to introduce a 3090 with an eight-processor configuration next. But Jeffery claims the performance degradation caused by that move would be too great. He theorizes the vendor will introduce a new generation of mainframes.

"Summit is a very definite possibility for 1988," says Kimball Brown, an analyst with Dataquest Inc., San Jose, CA. "Something has to happen, whether it is just a performance kicker for each processor or a new generation. Customers are going to demand it." Brown adds that if past practice is any indication, IBM will ship Summit next summer. "It will probably do a combination of things, the first being to increase clock speeds. Shortly thereafter it will announce Summit."

And what will Summit be? A faster and bigger mainframe, that's certain. But it will also perform more like a parallel processor, says Martin, by offloading database processing to a back-end engine, much like the 3090's vector processing facility. It will also include special fiberoptic serial channels, which will make use of faster disk drives and controllers.

Most analysts believe the first step toward Summit will take place later this year when IBM introduces new disk drives and controllers. The consensus: the drives will employ triple-density technology and offer 7.5 gigabytes of capacity. IBM will ship the drives during the second half of the year, say analysts, because NAS and Amdahl are scoring with Japanese-made products that equal or beat IBM performance at a cheaper price.

Still, new disk drives and the first shipments of the 937X and PS/2 alone will not be enough to restore IBM to high growth rates. During the first quarter of this year, IBM's sales rose only 6 percent and its profits dropped 23 percent, compared with the same period in 1986. Yet many analysts found reason to rejoice, because the results were not as bad as they had predicted. "Relative to where they've come from, the first quarter wasn't so bad," says Djurdjevic. "But contrasted to others in the industry, where there is lots of good news for a change, IBM doesn't look very good." Djurdjevic and others say it won't be much different this year, but watch out for 1988. That's when observers expect all IBM's announced and yet-to-be announced products to come together to produce the first robust financial results in three years.

The message for MIS: Enjoy the ride while you can. Like all good things, this must come to an end. D

A Hayden/VNU Publication

July 1987

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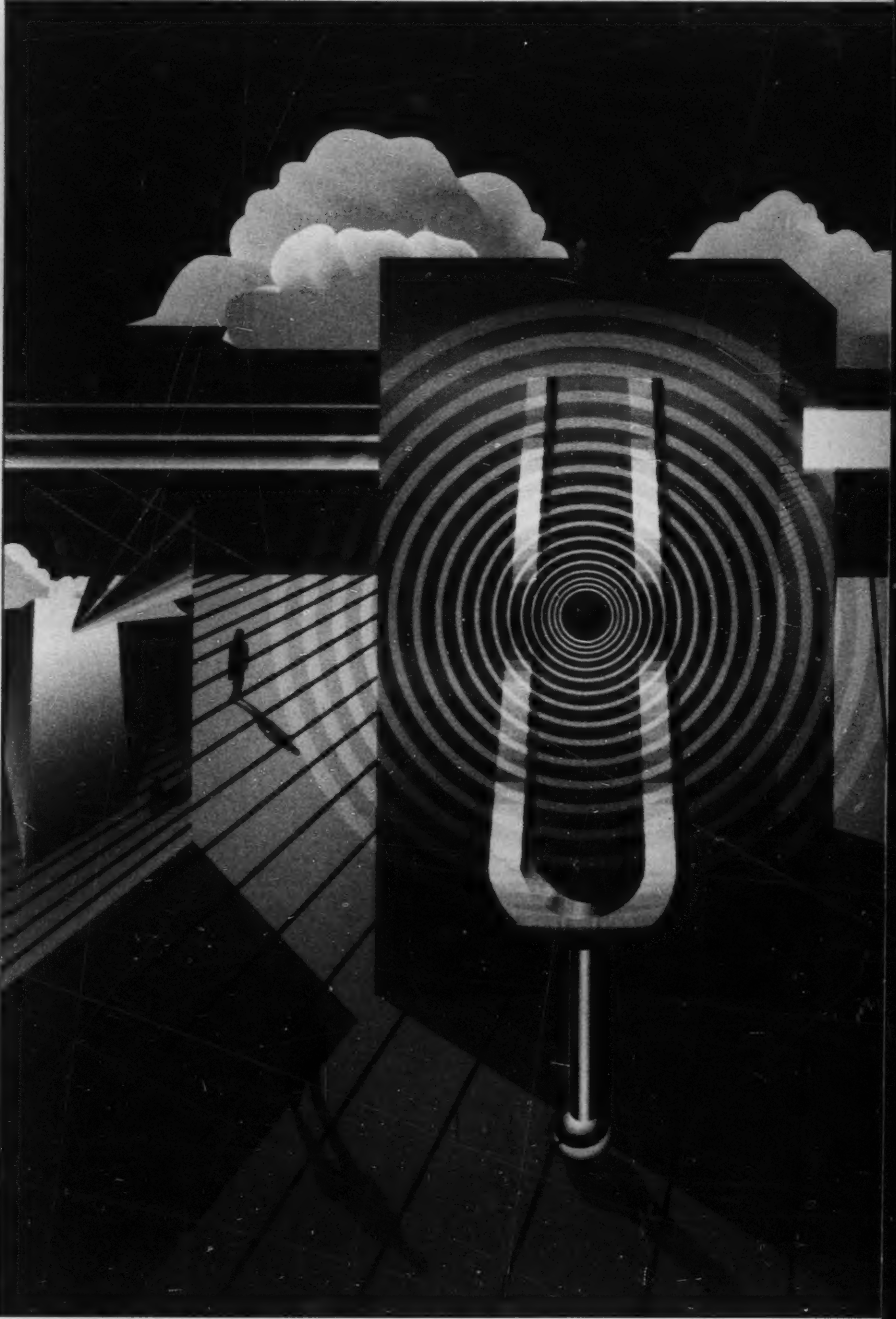
Computer & Communications DECISIONS

FINE-TUNING MAINFRAMES IN THE HIGH-MIPS ERA



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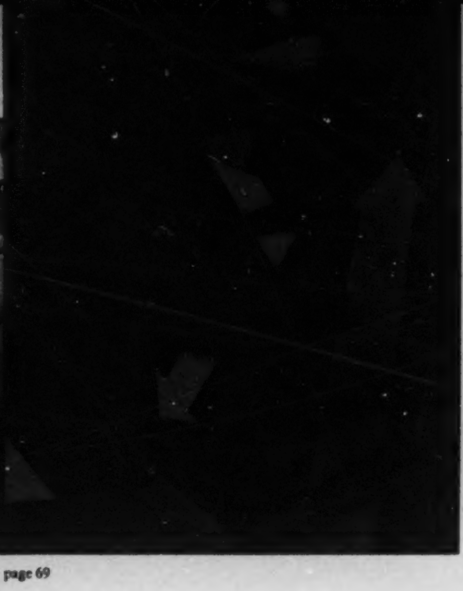

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Computer & Communications DECISIONS (USPS 771-1040 ISSN 0010-4558) is published monthly, except for two issues in January, February, and March, for $65 per year by Hayden Publishing Co., Inc., a subsidiary of VNU, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604. Second-class postage paid at Hackensack, NJ 07602, and additional mailing offices. POSTMASTER: Send address change to *Computer & Communications* DECISIONS, P.O. Box 1031, Southeastern, PA 19398. For subscription information, please call (215) 337-8623.

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Cover Computer Illustration: *Ron Morecraft*

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FOLLOWING THE LEADERS

Workstation leaders feel the heat

by Lee Keough

Technical workstation vendors, the high fliers of the computer industry for the past two years, are following a pattern familiar to their counterparts in the microcomputer market. As prices have fallen and functionality expanded, the market for new applications has exploded.

In the scramble to capitalize on new market opportunities, workstations from hardware heavyweights Digital Equipment Corp. and IBM have not been able to seriously challenge entries from market leaders Sun Microsystems Inc. (Mountain View, CA) and Apollo Computer Inc. (Chelmsford, MA). In an attempt to change that trend, last month DEC slashed the prices of its workstations by up to 48 percent, and it's now offering its VAXstation 2000 for $4,600. DEC officials say its new pricing structure will broaden the workstation market.

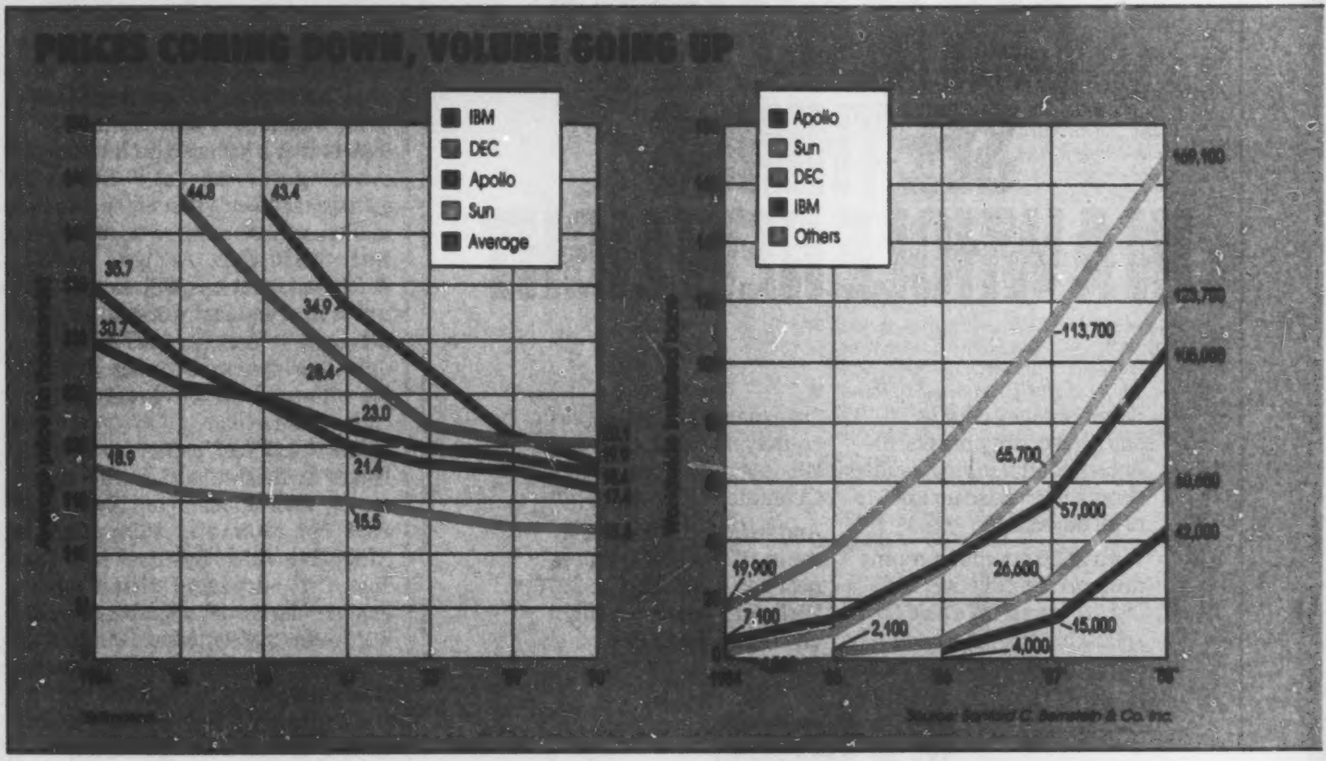
Apollo and Sun also face competition from market newcomers. At the low end, a number of Japanese and American vendors are rushing to provide low-cost versions of workstations offered by Sun and Apollo. At the high end, more vendors—including Sun and Apollo—are lining up challenges to superworkstation leader Silicon Graphics (Mountain View, CA).

"Superworkstations are a hot idea right now," says John P. Rohal, an analyst with Alex. Brown & Sons, a Baltimore-based stock brokerage. Priced at $60,000 to $100,000 each, these workstations deliver to the desktop the processing and graphics power needed for simulation, three-dimensional modeling, and animation.

Silicon Graphics, with sales of $80 million last year, markets workstations based on a reduced instruction set computing (RISC) architecture. Silicon Graphics offers the best blend of graphics and power, says Rohal, but other vendors are coming up fast. Hewlett-Packard Co. and Apollo, for example, have targeted superworkstations as a high-growth market.

In May, Hewlett-Packard announced the HP 9000 Model 825 SRX workstation, part of its Spectrum line of RISC-based technical computers. At 8.2 million instructions per second (MIPS), the 825 SRX offers the highest performance rating of any workstation on the market. Apollo claims its DN590 Turbo

Denise Barbieri



Price reductions and additional functionality are greatly expanding the technical workstation market. Market leaders Sun and Apollo are continuing their market dominance by pricing their machines aggressively.

workstation offers the best price/performance ratio in the superworkstation market. Analysts add that some well-financed startups are expected to introduce competitive offerings by the end of this year.

Rosalie Buonauro, director of marketing for Silicon Graphics, says that Silicon's RISC-based architecture is a key advantage in the superworkstation market. Only Hewlett-Packard is positioned to compete, she says, adding that Apollo and Sun will have to find ways to overcome the performance limits of the Motorola 68020 chip to equal the power potential of a RISC machine.

Buonauro says that while its competitors are seeking growth through their own installed bases, Silicon Graphics is still focused on providing new applications that do not overlap with those of the mainstream vendors.

Sun Microsystems is investing from $10 million to $12 million to bring out a superworkstation this year. John Hime, Sun's vice president of product marketing, will not discuss the development project. But, he says, no other workstations on the market, including those offered by Silicon Graphics, can be classified as superworkstations. "Nothing comes close," he contends. "When and if we come out with a superworkstation, it will be significantly more powerful than anything on the market now."

Sun's trademark is aggressive pricing. If Sun enters the high end of the market, it will probably pose a stiff price challenge to Silicon Graphics and its competitors.

While Sun appears to be aiming high at superworkstations, it is also planning a foray into the microcomputer market, analysts say. They point to Sun's April price reduction, to less than $5,000, of its diskless workstation, which runs at 1.5 MIPS and offers 1 Mbyte of memory. "Sun's desk-top machine may not be expensive, but Sun has recognized it can make most of its money on peripherals and software," says Robert Herwick, an analyst with San Francisco stock brokerage Hambrecht & Quist.

Mark Stahlman, an analyst with Sanford C. Bernstein & Co. Inc., says that Sun's price cut is deceiving. It merely reflects the price of the diskless workstation after it was discounted—which it often was. "Sun dropped the price to get the attention of software developers and personal computer retailers," says Stahlman. "I look at it as a calling card into the microcomputer market." Stahlman guesses that Sun's first entry into that market will be a micro based on the Intel 80386 chip. Analysts say that 386-based machines will not be a factor in the technical workstation market until a version of AT&T's Unix operating system becomes available for them. Sun, obviously, could change that.

Sun itself can expect some challenges at the low end from vendors selling micros based on 32-bit Intel 80386 or Motorola 68020 chips. In May, Televideo Systems Inc. (San Jose, CA) introduced what it calls an engineering workstation based on the 80386 for $3,995. More vendors are expected to follow with 386-based workstations.

Competition from Japan is expected to increase, although its impact is uncertain. Last month, NEC Information Systems introduced the first

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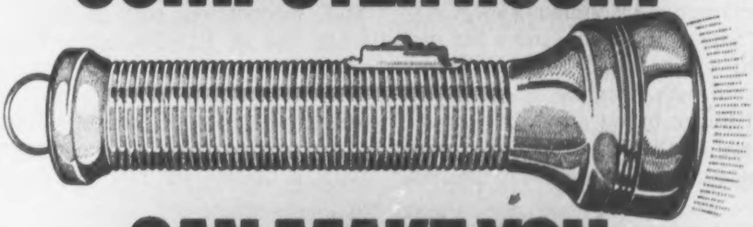

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CIRCLE 21

Sun "clone," a 32-bit technical workstation based on the Motorola 68020 chip. "The Japanese have every intention of producing Sun clones, using the Motorola chip and probably Ethernet," says Herwick. Sun's John Hime, noting that NEC's workstation can't run Sun software, disputes its description as a clone. He also doubts NEC poses a threat to Sun, a prognosis with which Herwick agrees. "Those clones will be mere hot boxes, without software development tools," Herwick notes. "That's why I don't think the Japanese are a significant threat to Sun." Both Herwick and Sun officials agree, however, that Japanese vendors could become a factor in the market if they offer users lower prices, a likely scenario.

If Japanese vendors aren't serious threats to Sun in low-cost workstations, some of the old-line minicomputer computer-aided design and manufacturing vendors might be. These vendors have suffered at the hands of workstation vendors offering users better price/performance ratios. Intergraph Corp., Huntsville, AL, for example, has regrouped and plans to retake some business from Sun and Apollo with its Interpro 32C and Interact 32C workstations. Intergraph's workstations are based on Fairchild Semiconductor's "Clipper" microprocessor; they run Intergraph applications software under Unix. Intergraph is selling its workstations through value-added resellers. Due to a scarcity of Clipper chips, Intergraph has had trouble meeting its initial orders, but the vendor claims that the problem is being resolved.

While Sun pursues an aggressive pricing strategy, Apollo has indicated it will not play the same game, according to Herwick. "Apollo emphasizes support, graphics capability, and third-party applications," he says. "In all three areas, it is superior to Sun."

Analysts say both Apollo and Sun have a good shot at becoming broad-based systems suppliers. That should be good news for users with big commitments to the vendors' respective standards efforts in components, software, and communications protocols. Both also have have sophisticated networking schemes that give users access to information stored across incompatible systems.

"Falling prices are driving the market, but networking is driving the differentiation between vendors," says John Rohal. Sun, with its Network Filing System, has led the effort to provide networking tools that allow users to share files across incompatible systems. Not to be outdone, Apollo this past spring began pushing its Network Computing System as a standard for sharing applications between dissimilar machines.

Stahlman believes Sun and Apollo will continue to maintain their leads in the workstation market over larger vendors like IBM, Digital Equipment Corp., and Hewlett-Packard. Although International Data Corp. pegs Hewlett-Packard as the future workstation leader, with Sun and Apollo close behind, other analysts contend that Hewlett-Packard sells its workstations as adjuncts to its instrument business and is thus not in direct competition.

"The workstation market is moving into the 'established' phase," notes Stahlman. "Soon it will be nearly impossible to catch Apollo or Sun." ■

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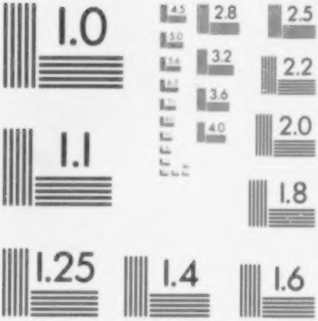
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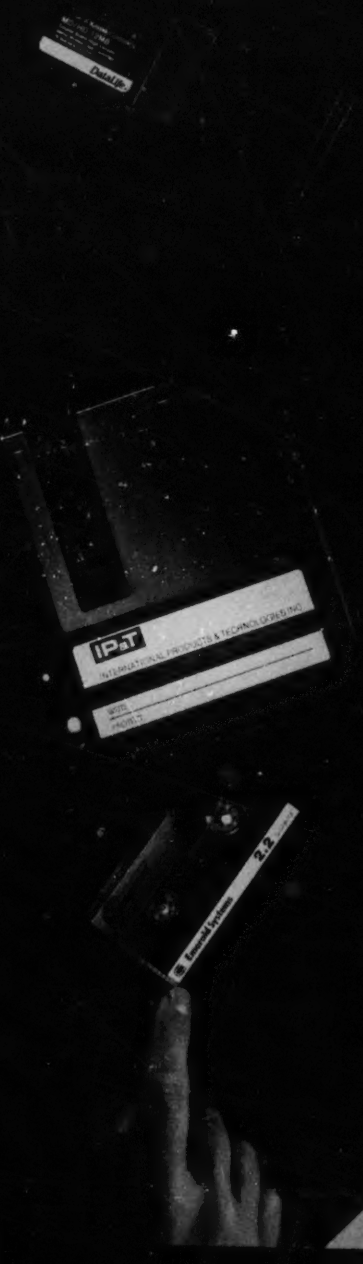
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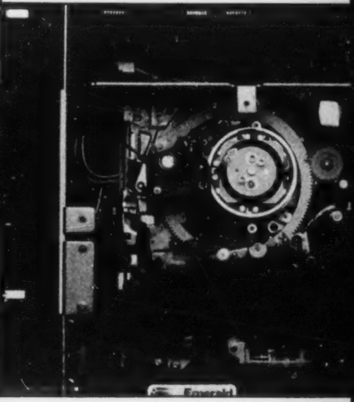

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PERFORMANCE REPORT

Software and services: Strength in unity

For large-system software and service vendors, growth-by-acquisition proved a profitable strategy last year—so profitable that the wave of mergers has continued to build.

by Lee Keough

Vendors of software and computer services decided last year that it's quicker to buy market presence than create it. The strategy is working: The top large-system software vendors grew 25 percent in 1986, and service vendors grew 13 percent.

The trend toward consolidation in these market segments shows no signs of abating, despite tax laws that discourage mergers. Indeed, the first half of this year saw the largest software acquisition ever—Computer Associates International Inc.'s purchase of Uccel Corp. (see "Going for number one, the easy way," page 92).

A close look at the financial performance of the top vendors of large-system software and services for the fiscal year ending March 31, 1987, uncovers several trends:

- Utility software vendors outperformed application vendors.
- Software consultancies grew at a healthy rate, albeit more slowly than expected.
- Software houses that serve the banking industry did a brisk business, as did third-party maintenance vendors in general.

Of course, there are exceptions. Oracle Corp., the pioneering vendor of database management systems compatible with IBM's Structured Query Language, turned in the best performance, growing a hefty 136 percent. Larry Ellison, CEO at Oracle, says a key to Oracle's success is portability. Only 25 percent of Oracle's revenues are derived from IBM mainframe customers, he says.

Others in the market didn't fare so well. The popularity of IBM's DB2 continued to give Cullinet Software Inc. headaches—Cullinet's IDMS DBMS isn't compatible with DB2. Cullinet is taking a cue from Oracle's success. Under new CEO David L. Chapman, Cullinet has announced IDMS support for SQL and is eyeing new markets, including Unix and manufacturing applications.

IBM's new commitment to application development—through a new Application Systems division—is expected to widen the market for packaged systems. "We want to energize and focus internally to get more timely application solutions," says Joseph M. Guglielmi, who heads the new division. A second goal is to focus the efforts of independent software vendors on IBM hardware, particularly in midrange systems, he says. To that end, the new division may embark on strategic partnerships, but it will stop short of buying up independent vendors, he adds.

"IBM is already selling applications, so there is nothing ominous about this," observes John P. Imlay, chairman of Management Science America Inc. "This opens a line of communication with us," he adds, speaking for the Association of Data Processing Service Organizations.

The first project to be tackled by the division is office application development, says Guglielmi. The uniting of IBM's two current office systems, DISOSS (Distributed Office Support System) and Profs (Professional Office System), is expected to come out of that project.

IBM also sees opportunities in the computer-integrated manufacturing and banking markets. In the CIM arena, IBM will strive to enhance its existing manufacturing packages, Mapics and Topics, add computer-aided design and manufacturing software and robotics, and create a "back-office" accounting system for manufacturing plants. Guglielmi says IBM is developing systems to cash in on the surge in the banking market.

Rick Friedman

Larry Ellison (top) built a winning strategy at Oracle; David Chapman hopes to do the same at Cullinet.

Ted Jastrzembski, software analyst for International Data Corp., Framingham, MA, agrees that IBM's new effort in applications should help, rather than hinder, independent vendors. "IBM has not been a substantial

'87	'86	Company	'87 Revenues (000)	'86 Revenues (000)	% Growth
		Large-Systems Software			
1	1	Computer Associates Int'l. Inc. *(Garden City, NY)*	309,315	191,032	62
2		The Dun & Bradstreet Corp. *(New York)*	270,000*	N/A	N/A
3	4	Management Science America Inc. *(Atlanta)*	210,541	156,108	35
4	3	Sterling Software Inc. *(Dallas)*	196,673	178,835	10
5	2	Cullinet Software Inc. *(Westwood, MA)*	163,304	182,803	−11
6	9	Policy Management Systems Corp. *(Columbia, SC)*	160,025	109,832	46
7	7	AGS Computers Inc. *(Mountainside, NJ)*	154,000	128,568	20
8	6	Uccel Corp. *(Dallas)*	150,311	132,061	14
9	5	Ameritech Inc. *(Chicago)*	142,401*	139,989*	2
10	8	Triad Systems Corp. *(Sunnyvale, CA)*	111,981	114,252	−2
11		SAS Institute Inc. *(Cary, NC)*	102,400*	N/A	N/A
12	17	Oracle Systems Corp. *(Belmont, CA)*	101,709	43,006	136
13	11	Pansophic Systems Inc. *(Oak Brook, IL)*	100,979	79,080	28
14	10	Cincom Systems Inc. *(Cincinnati)*	100,000**	89,000**	12
15	13	Information Builders Inc. *(New York)*	95,000*	70,000*	36
16	12	Ask Computer Systems Inc. *(Los Altos, CA)*	93,489	70,193	33
17	14	Comshare Inc. *(Ann Arbor, MI)*	68,493	67,987	1
18	16	Compuware Corp. *(Birmingham, MI)*	68,200	60,100	13
19	15	Software AG Systems Inc. *(Reston, VA)*	66,485	61,141	9
20	21	On-Line Software International Inc. *(Fort Lee, NJ)*	53,509	33,302	61
21	18	Intermetrics Inc. *(Cambridge, MA)*	47,747	42,631	12
22	23	Relational Technology Inc. *(Alameda, CA)*	45,000**	28,100**	60
23	20	American Software Inc. *(Atlanta)*	44,246	35,765	24
24	24	Hogan Systems *(Dallas)*	44,091	27,013	63
25	19	Keane Inc. *(Boston)*	40,712	39,571	3
26	22	Boole & Babbage Inc. *(Sunnyvale, CA)*	37,293	31,582	18
27	27	Duquesne Systems Inc. *(Pittsburgh)*	33,207	15,377	116
28		Morino Associates Inc. *(Vienna, VA)*	31,198	N/A	N/A
29	26	Goal Systems International Inc. *(Columbus, OH)*	29,231**	17,553**	67
30	25	VM Software Inc. *(Reston, VA)*	29,009	19,154	51
		Total Large-Systems Software	3,100,549	2,164,035	25†
		Computer Services			
1	1	TRW Inc. *(Cleveland)*	1,650,000	1,450,000	14
2	2	Automatic Data Processing Inc. *(Roseland, NJ)*	1,347,533	1,152,417	17
3	3	McDonnell Douglas Corp. *(St. Louis)*	1,198,500	1,106,700	8
4	4	Electronic Data Systems Corp. *(Dallas)*	1,176,500	998,000	18
5	6	Computer Sciences Corp. *(El Segundo, CA)*	1,031,459	838,587	23
6	5	General Electric Co. *(Fairfield, CT)*	775,000	855,000	−9
7	7	Arthur Andersen & Co. *(Chicago)*	635,900**	477,300	33
8	8	Martin Marietta Corp. *(Bethesda, MD)*	467,400*	429,900*	9
9	9	Emhart Corp. *(Farmington, CT)*	408,896	395,298*	3
10	10	Shared Medical Systems Corp. *(Malvern, PA)*	384,229	326,781	18
11	12	Bell Atlantic Corp. *(Philadelphia)*	238,000	202,000	18
12	11	The Boeing Co. *(Seattle)*	235,000	225,000	4
13		Mtech Corp. *(Dallas)*	201,709	N/A	N/A
14	13	HBO & Co. *(Atlanta)*	151,030	185,862	−19
15	14	Computer Task Group Inc. *(Buffalo, NY)*	149,983	121,988*	23
16		Intelogic Trace Inc. *(San Antonio, TX)*	145,250	N/A	N/A
17	16	American Management Systems Inc. *(Arlington, VA)*	143,947	115,233	25
18	17	Grumman Corp. *(Bethpage, NY)*	137,767	115,015	20
19	15	Systematics Inc. *(Little Rock, AR)*	135,114	117,664	15
20		Touche Ross & Partners *(Toronto, Ontario)*	135,000**	N/A	N/A
21		Peat Marwick *(Montvale, NJ)*	125,000**	N/A	N/A
22	19	Arthur Young & Co. *(New York)*	118,000**	105,000**	12
23	18	Anacomp Inc. *(Indianapolis)*	110,740	106,653	4
24		Price Waterhouse & Co. *(New York)*	100,000**	N/A	N/A
25	25	C3 Inc. *(Reston, VA)*	86,300	46,535	85
26	22	First Financial Management Corp. *(Atlanta)*	83,733	56,290	49
27	20	Systems Management America Corp. *(Norfolk, VA)*	80,000*	62,000*	29
28	24	Cycare Systems Inc. *(Phoenix)*	59,314	51,848	14
29	21	SEI Corp. *(Wayne, PA)*	59,205*	59,655*	−1
30	23	Computer Horizons Corp. *(New York)*	58,476**	50,892	15
		Total Computer Services	11,628,985	9,651,523	13†
		Total Software and Services	14,729,534	11,815,558	15†

Total '87 Revenues (000)	Total '87 Profits (000)
309,315	36,494
3,113,506	339,990
210,541	13,983
196,673	2,758
163,304	(17,843)
160,025	14,599
413,800	9,913
150,311	20,425
9,374,300	1,143
111,981	3,913
102,400	N/A
101,709	10,592
100,979	16,225
100,000	N/A
95,000	N/A
93,489	13,191
68,493	1,952
68,200	N/A
66,485	4,216
53,509	4,178
47,747	629
45,000	N/A
44,246	8,570
44,091	9,512
40,712	1,081
37,293	1,467
33,207	7,074
31,198	5,937
29,231	N/A
29,009	5,072

6,234,400	N/A
1,347,533	122,886
12,653,200	(96,400)
4,421,900	205,900
1,031,459	32,243
37,658,000	2,579,000
1,924,000	N/A
4,807,000	202,300
408,896	N/A
384,229	33,284
10,026,800	1,184,700
16,577,000	635,000
201,709	10,089
151,030	(3,523)
149,983	5,193
145,250	12,647
143,947	5,397
3,528,004	16,381
135,114	10,862
513,000	N/A
1,350,000	N/A
1,427,000	N/A
110,740	10,026
742,000*	N/A
86,300	4,200
83,733	6,409
80,000	N/A
59,314	2,364
118,540	(7,097)
58,476	2,186

*CY '86, '85
**FY All others based on April '86 to March '87 results.
†Total growth rates are based only on known comparitive revenues.*

WHO'S HOT . . .

Company	'87 Revenues (000)	% Growth	'86 Revenues (000)
1 Oracle Systems Corp.	101,709	136	43,006
2 Duquesne Systems Inc.	33,207	116	15,377
3 C3 Inc.	86,300	85	46,535
4 Goal Systems Int'l. Inc.	29,231**	67	17,553**
5 Hogan Systems	44,091	63	27,013
6 Computer Associates Int'l. Inc.	309,315	62	191,032
7 On-Line Software Int'l. Inc.	53,509**	61	33,302**
8 Relational Technology Inc.	45,000**	60	28,100**
9 VM Software Inc.	29,009	51	19,154
10 First Financial Mgt. Corp.	83,733	49	56,290

***FY*

. . . WHO'S NOT

Company	'87 Revenues (000)	% Growth	'86 Revenues (000)
1 HBO & Co.	151,030	-19	185,862
2 Cullinet Software Inc.	163,304	-11	182,803
3 General Electric Co.	775,000	-9	855,000
4 Triad Systems Corp.	111,981	-2	114,252
5 SEI Corp.	59,205*	-1	59,655*
6 Comshare Inc.	68,493	1	67,987
7 Ameritech Inc.	142,401*	2	139,989*
8 Keane Inc.	40,712	3	39,571
9 Emhart Corp.	408,896	3	395,298
10 Anacomp Inc.	110,740	4	106,653

**CY '86, '85*

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application vendor before now," says Jastrzembski. "This effort legitimizes the solution side of the software business." Imlay adds that once IBM encourages users to buy packaged applications, rather than develop them inhouse, users will look at all alternative offerings on the market.

Computer service vendors fared less well than their counterparts in software. "Professional service vendors are doing well in general," says Jastrzembski, "but a lot of small shops are hurting." As a result, he says, large consultancies have been snapping the smaller shops.

Small service vendors are being caught in a pricing web. "Professional service vendors have finally penetrated the price barrier," says Thomas Lawton, Belmont, MA-based editor of *Computer Services Report.* Lawton says consultancies have hiked their prices to the point at which customers are beginning to choose a service vendor based on cost, rather than service. Jastrzembski adds that customers now expect specialized expertise for their money. "Users are no longer interested in buying the service of a Cobol programmer," he says.

The rise of heterogeneous networks and an increasing demand for specialized knowledge are also factors influencing the rest of the computer service industry. Victoria Marney-Petix of Dataquest, a San Jose, CA-based market researcher, says network service vendors are beginning to offer application support on their networks. The public data networks that don't keep up with that trend could fail, she says.

Third-party maintenance vendors are enjoying an upsurge in demand, averaging nearly 20 percent annual growth, because users need service contracts that will cover a myriad of hardware vendors. Another factor fueling third-party maintenance growth is the increased cost of service agreements from IBM and Digital Equipment Corp.

Analysts say these trends will continue for the foreseeable future. If so, large-system software and service vendors will continue to be the envy of hardware suppliers. **D**

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October 1987

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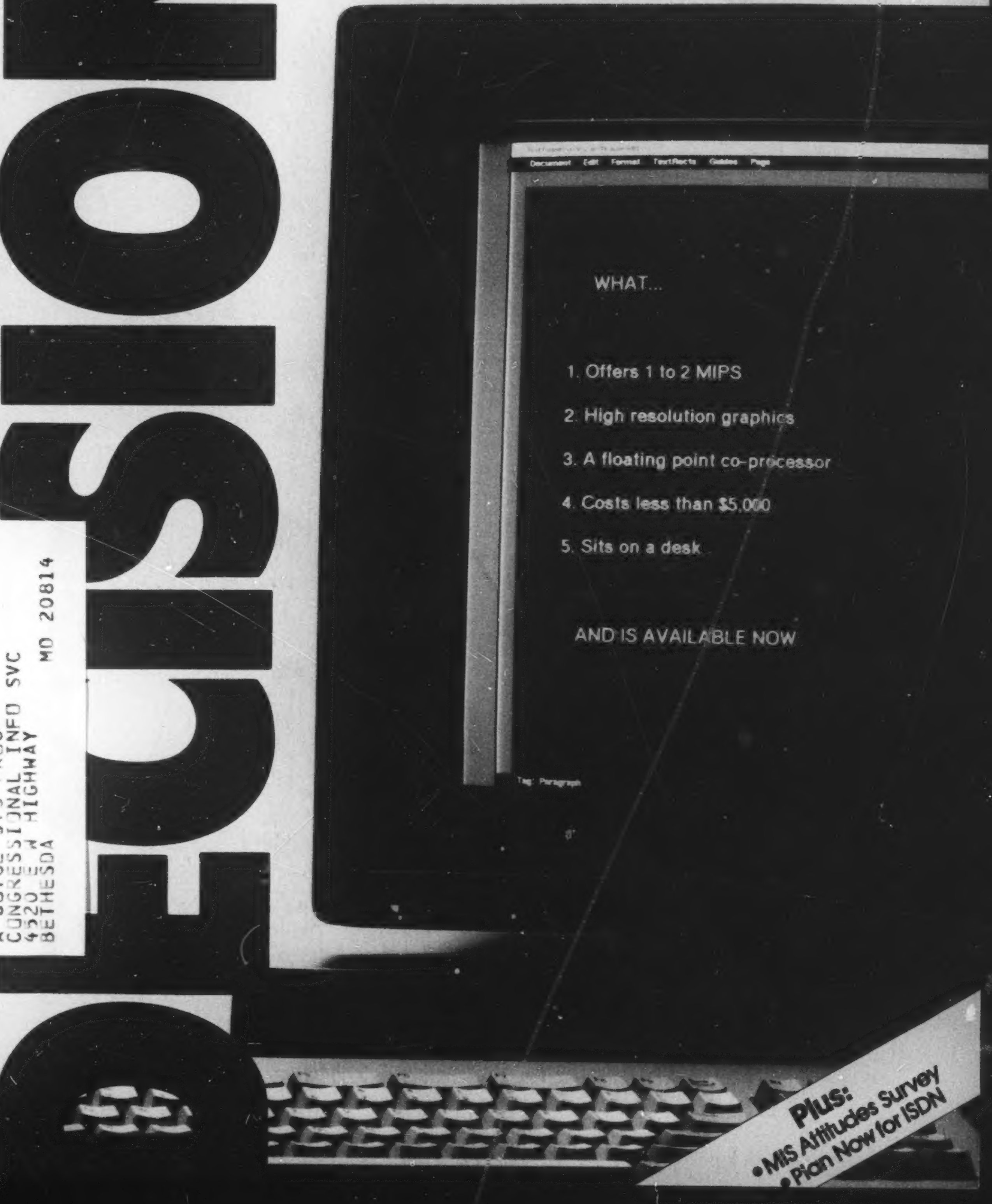
WORKSTATIONS THAT OUTMUSCLE MICROS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EDITOR'S MESSAGE

Ted Hardin

Up against the micro

When a marketing executive for one of the more successful suppliers of IBM PC clones heard of our plan to invite our MIS audience to "design" the optimal microcomputer (page 61 in this issue), his reaction didn't surprise me.

"Why bother," came the word from Texas, "when you can buy PCs configured any way you want?"

Well and good. I would, however, suggest that the gentleman, whose livelihood and golf game depend on a machine with less than 10 years of generic history under its belt, go to a library, pull out a mechanical encyclopedia, and look up "bicycle."

Bicycles, compared to computers, are pretty simple devices. But nobody today rides one that looks anything like the first four or five versions that were generic to their respective times. In spite of this, some people who assemble and sell them seem to think that microcomputers have already arrived at some sort of ultimate state.

I don't mean to underplay the practical miracle of desktop computing—I subscribe to it, with the general reservation that more credit for the miraculous is owed to the software side of the house than it will ever receive. And, on a personal level, I find myself bumping up against machine limitations far more often than I plumb the depths of a solid software application.

Another thing: I wish everyone reading this would immediately mail me the cash, per minimum wage hourly rate, for time they have spent taking the cover off of a PC or clone, removing an add-in board and resecuring both it and the case—for purposes of changing *one* dip switch setting. I most surely would never have to buy another state lottery ticket. What I'm alluding to, of course, is that microcosm of an MIS department all of us have to singlehandedly staff and manage if we want to pull real productivity out of a micro.

My current real-life example, if you must know, deals with mating a new Bernoulli Box II with a PC's Limited 286 running at 12 MHz. This stuff is good hardware, as far as I can tell; the drives give you unlimited storage—at 40 Mbytes per set—with expedient, Winchester-like access, and the computer itself is swift and reliable. But having followed documentation for both components to the letter, one phones Utah (Iomega) to find that the 286 will have to run in third gear (6 MHz) to boot from and access the Bernoulli unless one wants to try an "unsupported" driver (until the supported version is available, maybe by year end). I do, I do. Ah, but installation of the new driver means also to get back into the box, pull the interface card and change . . . one dip switch.

So far, I have done nothing more than stare at it for two weeks.

I will eventually prevail. So will we all. We have accepted the fact that we have to finish building these systems after we buy them and have even bought the semantics that turn it into an advantage called expandability. In the meantime, the editors of DECISIONS are looking forward with considerable anticipation to your interpretations of what kind of functionality package a microcomputer could really become.

Robin Nelson

THE DECISIONS/PAINE WEBBER SURVEY

IBM ON THE REBOUND

Results from the second DECISIONS/Paine Webber Survey of MIS Attitudes show that MIS looks favorably on IBM's recent moves, particularly its PS/2.

by John Rymer

The most telling result of the second DECISIONS/Paine Webber Survey of MIS Attitudes is a dramatic improvement in respondents' general opinion of IBM. IBM scored the largest gain—23 percent—in the second survey's Vendor Popularity Index, which tracks short-term opinion shifts on selected suppliers.

IBM's uptick seems primarily attributable to its Personal System/2–Operating System/2 microsystem, its 937X midrange processors, and, to a much lesser extent, the potential of Systems Application Architecture. PS/2–OS/2 and SAA were announced after the first survey was complete, this past spring, but before the second survey was taken, in June.

"The results say IBM is getting its message across, but must deliver the goods," says Stephen K. Smith, vice president at Paine Webber Inc., cosponsor with DECISIONS of the survey.

There were other winners in the second MIS attitudes survey. US Sprint demonstrated an appeal that showed it is a serious challenger to MCI Corp. as AT&T's chief long-distance rival. AT&T and Northern Telecom Inc. also registered gains in popularity as communications equipment suppliers. Software vendors Management Science America Inc., Computer Associates International Inc., and On-Line Software International Inc. improved their standings with respondents. The results also suggest that user opinions of Digital Equipment Corp. and their plans to buy DEC products are holding steadily high despite IBM's gains.

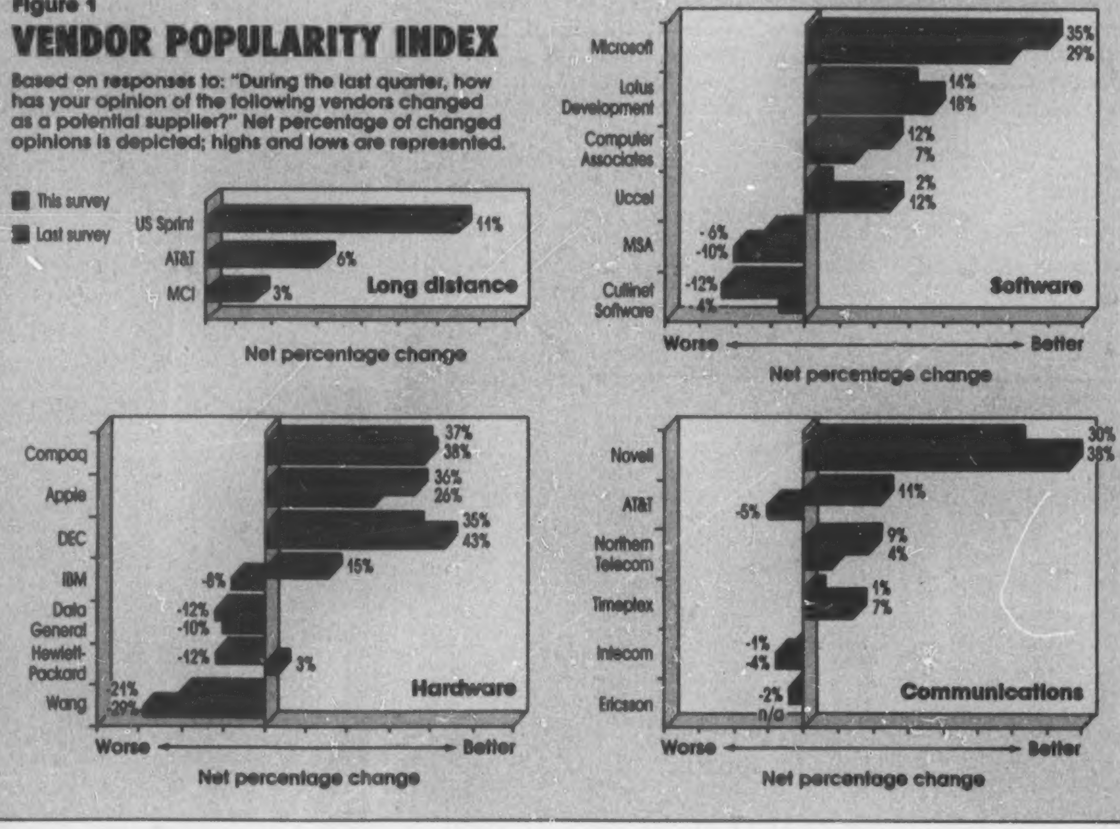
On a roll

The second survey's results say the PS/2 is a big hit with MIS (see Figure 4). Of the 838 respondents—a sample heavily weighted toward IBM

Figure 1

VENDOR POPULARITY INDEX

Based on responses to: "During the last quarter, how has your opinion of the following vendors changed as a potential supplier?" Net percentage of changed opinions is depicted; highs and lows are represented.



Charts by Vincent J. Gallo/Janet Kranke

shops—28 percent said they would acquire PS/2s during the third quarter of the year, and 47 percent said they would buy before year's end. As expected, intentions to buy PS/2s are significantly higher among respondents with IBM mainframes.

These numbers are high for a new machine, particularly considering that the key to unlocking the power of the PS/2's architecture—the OS/2 operating system—won't be available in its initial version until the end of the year. The ability of IBM and Microsoft Corp., OS/2's developer, to deliver the operating system appears to be an article of faith among MIS managers. Responses to a question about attitudes toward OS/2 indicate that the majority of respondents still have questions—but fewer than might be expected. Only 51 percent of the respondents said it was too early to judge OS/2 (52 percent of respondents with large IBM mainframes). However, 26 percent of respondents (34 percent of those with large IBM mainframes) are factoring OS/2 into their plans—again, high numbers for a product that can't yet be fully evaluated. "This result shows that corporations will be adopting OS/2," says Robert Therrien, software analyst for Paine Webber. "Many people have been waiting for this kind of system for years. OS/2 lets you put a minicomputer on your desktop."

Still other results suggest PS/2 has become a planning—read that, "long-term"—consideration for respondents, particularly IBM shops. When asked which of a list of products, standards, and architectures were important to respondents' planning, the PS/2 came out on top by far. Forty-five percent overall said the PS/2 was a planning consideration; token-ring local-area networks were the next most important factor, at 32 percent. Among current IBM 3090 and 308X users, however, 54 percent are including PS/2, and presumably OS/2 as well, in their plans.

Paine Webber's Smith believes only IBM could pull off this kind of reception to a new micro architecture and operating system. "Anybody else who announces something as far off and intangible as OS/2 and SAA simply wouldn't get the airtime," he says.

The PS/2–OS/2 launch undoubtedly was boosted by Microsoft's reputation. In the second survey, Microsoft continued to score highest (most positive) among all software vendors.

MS-DOS: The future is now

Yet the positive reception of PS/2 and OS/2 by corporations may not mean that a move toward the new standard will come at the expense of the older MS-DOS machines. When asked which micros respondents would be most likely to buy, the PS/2 scored high, but so did the IBM Personal Computer and micros from Compaq Computer Corp., as well as the "Other" classification, which likely means mostly PC-clone marketers. The question did not address volume, but the results imply that many if not most corporations will get into IBM's new game by buying only a few PS/2s this year.

The strength of the "Other" category, coupled with that of the PC and Compaq, bodes well for existing MS-DOS applications, at least in the short term. The user bases—and profits—of clone makers may well hold up until they are able to respond to the Micro Channel bus and integrated functionality of the PS/2.

SAA: Shrouded in doubt

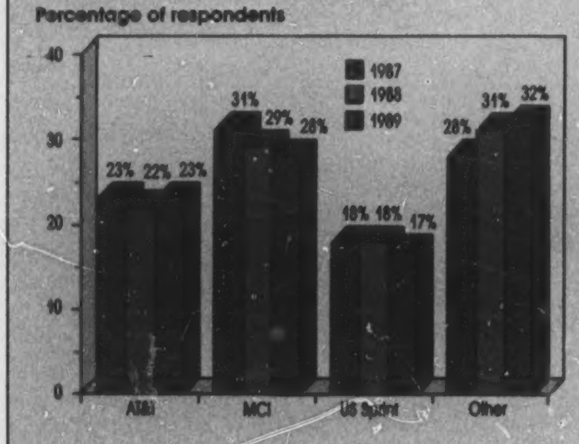
Many respondents are skeptical about IBM's ability to fully deliver SAA, a blueprint for distributing applications and functions across IBM's incompatible hardware platforms. SAA is massive and ambitious, and, respondents tend to think, still nebulous. "There are just too many remaining variables in SAA today," says Therrien.

The second survey probed long- and short-term indicators for SAA (see Figure 3). First, 83 percent of the respondents either don't like SAA, have no interest in or opinion about it, or are reserving judgment. Almost as

Figure 2

VYING FOR SECOND FIDDLE

Based on responses to question: "Who is/will be your secondary long-distance carrier?"

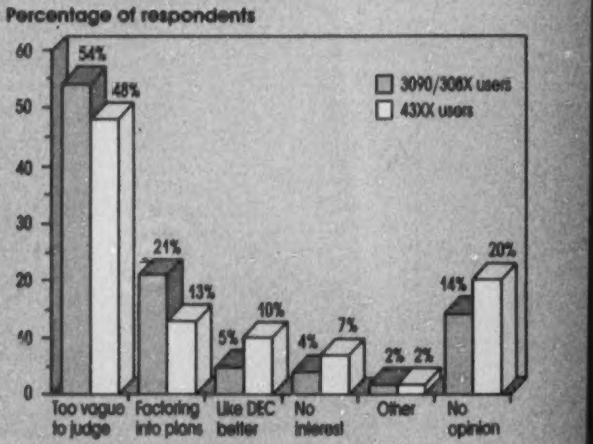


DECISIONS charts

Figure 3

SAA: WAIT AND SEE

Based on responses to: "Which best characterizes your attitude toward IBM's SAA?"



many respondents (12 percent) prefer DEC's architecture as are factoring SAA into their plans (14 percent). Respondents with large IBM mainframes are a bit more willing to go along, with 21 percent saying they're planning for SAA now.

The bad news for IBM is that 10 percent of the respondents with 43XXs said they like DEC's single processor/single operating system architecture better, only 3 percent less than said they were planning for SAA. The 43XX sites are crucial to IBM in its battles with DEC for the midrange market.

Overall, SAA was the third most important factor on the previously mentioned list of long-term planning priorities. Among respondents with large IBM mainframes, however, SAA was the second most important concern on the list of planning considerations, displacing token-ring LANs.

DEC's strength undiminished

DEC, the vendor whose success at the expense of IBM helped spur the announcement of SAA and other recent moves supporting distributed applications and processing, appears to have been largely unaffected by them. Responses indicate DEC's VAX midrange computers and DECnet communications architecture remain sources of considerable strength.

Still, DEC took a hit on the survey's broad measure of respondents' opinions of vendors. DEC's standing in the Vendor Popularity Index fell by 8 percent from the first survey. This result *could* be interpreted to mean that IBM's gain in popularity has come at the expense of DEC, but respondents' buying intentions for midrange computers don't support this conclusion. Thirty-nine percent of the respondents said they use VAXs as their primary midrange processors, and 19 percent plan to buy VAX 8XXX and -11/7XX processors. The closest competitor was IBM's 937X; 12 percent of respondents said they plan to buy it. DEC fared even better among respondents with large IBM mainframes: 49 percent have VAXs, and 20 percent plan to buy new ones. Large mainframe sites are also the basis for the 937X's indicated strength. Twenty percent of respondents with 3090s or 308Xs plan to buy 937Xs.

These results, says Smith, show that the 937X isn't having much effect on DEC's engine of growth. "The 9370 is being well received within the IBM base and is having some impact on Wang," he says. Smith notes that when midrange purchasing plans are broken out by vendor, the results indicate respondents are moving toward the VAX and 937X, and away from systems offered by vendors like Wang, Data General, and Hewlett-Packard.

Survey results indicate that more MIS dollars may be flowing to DEC and AT&T in the near term. When asked how much their spending with specific vendors will change this year compared with last year, respondents tabbed those two vendors most often for increases. For IBM, the percentage of respondents reporting plans to increase spending with IBM was flat compared with the previous survey.

The good news for IBM was in respondents' plans to buy IBM mainframes, and that capacity utilization remains high (see Figure 5). Twenty-six percent of the respondents indicated they had plans to buy 3090s, up 10 percent from the figure in the first survey. Among respondents with 3090 or 308X mainframes, 36 percent reported plans to buy 3090s, also up 10 percent from the first survey. Smith suspects that price cuts and price/performance improvements are the reason this larger demand wasn't translated into bigger spending increases for IBM.

Parting shots at Uccel

The second survey's results suggest that Computer Associates' chances of digesting archrival Uccel without loss of customer loyalty are probably good. Some respondents are unhappy that Uccel's management decided to sell out to its competitor. Uccel's standing in the Vendor Popularity In-

(Continued on page 100)

Figure 4

THE RISE OF PS/2

Based on responses to the question: "From which vendors do you/will you buy micros?"

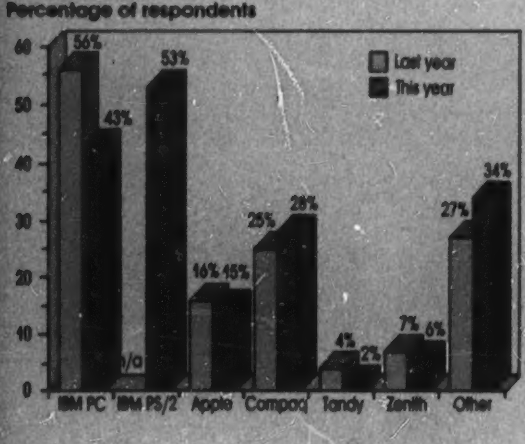
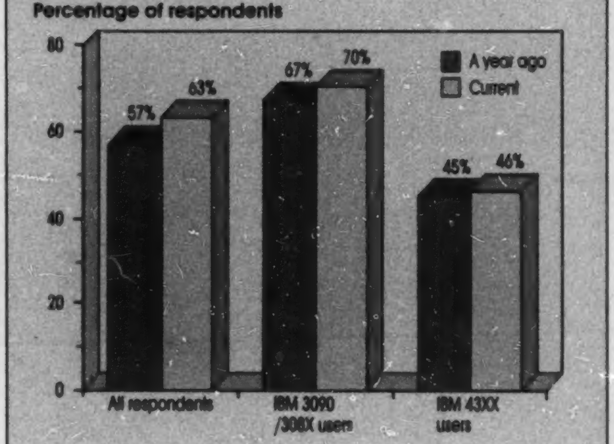


Figure 5

CAPACITY INDEX

Percentage of respondents reporting combined mainframe and mini capacity use of 75 percent or greater.



(Continued from page 77)

dex, an obvious gauge of respondents' reaction to the merger, fell by 10 percent, indicating a fair amount of displeasure.

This is understandable, given the fierce competition between Uccel and Computer Associates and the loyalties it engendered among users. The question is whether or not Uccel users will bolt from the newly merged company. The results suggest they won't, no matter how mad they are at Uccel. Computer Associates' popularity rating actually rose by 5 percent.

Of the other mainframe software vendors on the survey, all except Cullinet Software Inc. scored gains in popularity among respondents. As a group, these vendors ranked low in the results of the first survey, but respondents' opinions of them appear to be improving.

CASE: Searching for customers

One of the most surprising results of the survey is the low significance assigned to computer-aided software engineering (CASE) tools by respondents. In response to the question, "With 100 points to allocate, how would you assign the importance of [certain] software-development products in your organization?", integrated CASE tools received an average score of only seven. The highest scores were received by fourth-generation query languages, like Focus from Information Builders Inc. (25 points average) and 4GL development products, like ADS-Online from Cullinet (18 points average).

These scores don't indicate buying plans or installed bases for these products. Rather, they suggest which types of software development products respondents value most. Individual tools associated with CASE fared better, but still scored lower than more familiar 4GLs. Software design tools received an average score of 17, code generators, 12, and life cycle management tools, 8.

US Sprint vs. MCI

The most heated battle in long-distance telecommunications isn't between AT&T and any of its many competitors, according to respondents, but between MCI and US Sprint for the top share of the business AT&T doesn't get (see Figure 2). Results of the second survey indicate that US Sprint is worth betting on.

US Sprint appears to have momentum among respondents, while MCI does not. Responses to the question, "Who is/will be your secondary long-distance carrier [for 1987-89]?" indicate that MCI's share of AT&T's leavings will shrink, while US Sprint's will be virtually flat. That's a benefit by default, but a trend in US Sprint's favor nonetheless. US Sprint fared much better than MCI in the Vendor Popularity and Reputation Indexes.

The picture that emerges of respondents' plans for telecommunications traffic not handled by AT&T is not that rosy for either MCI or US Sprint. Indeed, it suggests the segment of the market available to MCI, US Sprint, and all other carriers will shrink relative to AT&T's growing share. The only growth indicated in the question about secondary carriers was for "Other," from 28 percent this year to 31 and 32 percent in 1988 and 1989, respectively, an implication that private corporate networks will assume a greater importance. **D**

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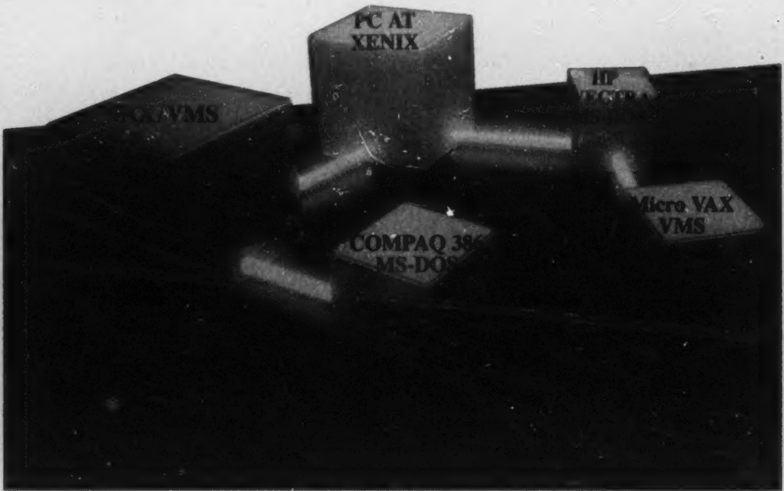

CIRCLE 61